Final Report

40CFR Part 63, Subpart ZZZZ Compliance Testing – Diesel Engine Nos. 1 & 2

Prepared for . . .

Client: Milton CAT Power Systems
Facility: wTe Recycling Inc.
Test Site: Greenfield, MA

Test Dates: 04/25-26/17

Prepared by . . .

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Montrose Project No. 15-093

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Statement of Certification

Report: 40CFR Part 63, Subpart ZZZZ Compliance Testing – Diesel Engine Nos. 1 & 2

I hereby certify that the contents of this report were gathered and prepared in accordance with the test methods and/or procedures outlined herein. Furthermore, all calculations, emission summaries and supporting data are accurate to the best of my knowledge. I was both the field team leader and primary individual responsible for the report preparation.

David Caron, QSTI, Groups 1-4
Client Project Manager

Signature

06/7/17

Date

Reviewed By:

Andy Seaha, QSTI
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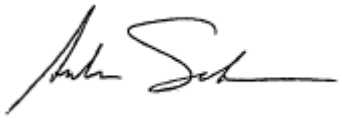

Signature

06/7/17

Date

Report Distribution List

Report: 40CFR Part 63, Subpart ZZZZ Compliance Testing – Diesel Engine Nos. 1 & 2

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6/7/17	1	Ms. Sandra Schwartz	EPA Region 1
6/7/17	1	Mr. Todd Wheeler	MassDEP

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Revision Description

Report: 40CFR Part 63, Subpart ZZZZ Compliance Testing – Diesel Engine Nos. 1 & 2

Revision Number	Revision Date	Revision Description
NA		

1.0 INTRODUCTION

1.1 General Overview

Montrose Air Quality Services, LLC's Newburyport, MA office (MAQS Newburyport/Montrose) was retained by Milton CAT Power Systems to perform emission testing services on their behalf for two diesel engines (Engine Nos. 1 and 2) operating at wTe Recycling Incorporated's Greenfield, MA facility. wTe operates two existing large diesel mechanical drive reciprocating engines which are regulated under the "National Emission Standards for Hazardous Air Pollutants (NESHAP) for Reciprocating Internal Combustion Engine (RICE) Maximum Achievable Control Technology (MACT) regulations". Specifically, both engines are classified as existing non-emergency, non-black start Compression Ignition (CI) engines (diesel) operating at an area source of Hazardous Air Pollutants (HAPs).

The objective of the emission test program was to document the compliance status of each engine with respect to the applicable limits presented in Table 2d, (>500HP) of 40CFR Part 63, Subpart ZZZZ. It should be noted that prior to the test program each engine was retrofitted with an oxidation catalyst (by Milton CAT). All testing was conducted in strict accordance with the previously submitted test protocol, Environmental Protection Agency (EPA) guidelines, the EPA Quality Assurance Handbook and the individual EPA Methods as found in 40 CFR 60, Appendix A. A summary of the parties involved in this test program are presented in Table 1-1.

1.2 Program Overview

Emission testing for each engine was comprised of three 60-minute test runs simultaneously conducted at the inlet and outlet of the control device (catalyst) while the respective engines were operating at maximum normal operating conditions. Each test run was comprised of Continuous Emission Monitoring System (CEMS) measurements for Oxygen (O_2) and Carbon Monoxide (CO) in accordance with EPA Methods 3A (O_2) and 10 (CO). All CO emission rates were corrected to 15%O_2 on a dry concentration basis (ppmvd) prior to comparison with the applicable emission standard(s). A summary of compliance results are presented in Table 1-2.

1.3 Report Organization

The remainder of this final report is organized into four additional sections. Section 2 presents a summary of emission results on an individual run basis. Source and traverse point summaries are

presented in Section 3. A description of the flue gas monitoring procedures is provided in Section 4, while Section 5 addresses the quality assurance/quality control aspects of the program. All supporting emission calculations, field data sheets and process data for Engine Nos. 1 and 2 are presented in Appendices A and B, respectively. Lastly, all quality assurance/quality control documentation is presented in Appendix C.

Table 1-1 Test Program Informational Summary

Source Information	
Facility Name:	wTe Recycling, Inc.
Facility Address:	75 Southern Avenue
	Greenfield, MA 01302
Facility Contact:	Mr. Christopher Pichette
Phone:	(413) 772-2200
Email:	cpichette@wTe.com
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Test Organization:	Milton CAT Power Systems
Contact:	Mr. Sten Levin
Phone:	(508) 482-5703
Email:	Sten_levin@miltoncat.com
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Title:	Client Project Manager
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Address:	Region 1, New England
	11 Technology Drive
	N. Chelmsford, MA 01863
Contact:	Mr. William Osbahr
Phone:	(617) 918-8389
Email:	osbahr.william@epa.gov

Table 1-2 Compliance Summary – Engine Nos. 1 & 2

Source	Pollutant	Test Result		Compliance	
		ppmvd@15%O_2	Removal Eff. (%)	Limits	Status
Engine 1	CO	17.43	87.30	≤23ppmvd@15%O_2; or ≥70% removal efficiency	Pass
Engine 2		19.48	90.89		Pass

2.0 EMISSION SUMMARIES

2.1 Emission Summaries – Engine Nos. 1 and 2

As previously discussed, emission testing was comprised of three 60-minute test runs. Each test run included simultaneously measurements for COppmvd@15%O_2 at the inlet and outlet of the catalyst while the engine operated at maximum normal operating conditions (see Section 2.2 for further detail). Diluent (O_2) and pollutant (CO) measurements were made throughout the test program in accordance with EPA Methods 3A and 10, respectively. A summary of the test parameters are presented in Table 2-1, while a summary of the test results on a run by run basis for Engine Nos. 1 and 2 are presented in Table 2-2 and 2-3, respectively.

Table 2-1 Summary of Test Parameters and Run Configuration

Source	Test Locations	Test Parameters	EPA Test Methods	No. of Runs	Run Duration
Engine Nos. 1 and 2	Inlet and outlet	CO	10	3	60-minutes
		O_2	3A	3	60-minutes

Table 2-2 Individual Run Summary – Engine 1

		Run Time		Inlet Concentrations			Outlet Concentrations			Removal Efficiency
				(O_2)	(CO)		(O_2)	(CO)		
Run ID	Date	Start	Stop	(%,vd)	(ppmvd)	(ppmvd@15%O_2)	(%,vd)	(ppmvd)	(ppmvd@15%O_2)	%
Run 1	25-Apr-17	10:32	11:32	9.74	267.8	141.64	9.70	32.96	17.37	87.74
Run 2	25-Apr-17	11:50	12:50	10.10	232.9	127.23	10.09	31.18	17.01	86.63
Run 3	25-Apr-17	13:05	14:05	9.54	276.7	143.65	9.47	34.68	17.91	87.53
Averages:				**9.79**	**259.1**	**137.51**	**9.75**	**32.94**	**17.43**	**87.30**

Table 2-3 Individual Run Summary – Engine 2

		Run Time		Inlet Concentrations			Outlet Concentrations			Removal Efficiency
				(O_2)	(CO)		(O_2)	(CO)		
Run ID	Date	Start	Stop	(%,vd)	(ppmvd)	(ppmvd@15%O_2)	(%,vd)	(ppmvd)	(ppmvd@15%O_2)	%
Eng. 2 - Run 1	26-Apr-17	7:50	8:50	9.94	451.9	243.33	9.86	38.80	20.74	91.48
Eng. 2 - Run 2	26-Apr-17	9:05	10:05	10.27	393.9	218.59	10.15	35.32	19.39	91.13
Eng. 2 - Run 3	26-Apr-17	10:23	11:23	10.47	326.1	184.42	10.38	32.68	18.32	90.07
Averages:				**10.23**	**390.6**	**215.45**	**10.13**	**35.60**	**19.48**	**90.89**

2.2 Process Data

RICE MACT requires that certain parametric monitoring data be continuously monitored to track continuous compliance with RICE MACT based on the initial data collected during the compliance tests. In order to set the compliance operating parameters for each engine, Montrose documented the following parameters at the onset of each test run and then at 15 intervals thereafter.

1. Engine RPM, 1-hr averages – recorded for engine panel
2. Catalyst Inlet Temperature, 1 –hr averages – recorded from Catalyst Monitor
3. Catalyst Inlet Temperature, instantaneous – from a Montrose thermocouple
4. Catalyst Delta P maximum (peak) per run – recorded from Catalyst Monitor.

It should be noted that these parameters will continue to be monitored by wTe as an indicator of continuous compliance. Due to operating load fluctuations intrinsic to shredding, the DP set point for action (as required by line 2a in Table 2b to subpart ZZZZ of Part 63) is based on the peak measurement read during the compliance test runs. These values were 1.0 and 1.8 inches of water for Engine Nos. 1 and 2, respectively (See appendices A4 and B4).

5. Engine hours at end of test

The shredder was operated under maximum normal operating conditions with Muni-ferrous as the feedstock. In order to verify that the shredder was operated normally during the emissions tests, the test processing rates have been compared to the 2016 average daily processing rates for Muni-ferrous. The mean 2016 Muni-ferrous processing rate was 68.77 tons per hour with a standard deviation of 11.17. As part of this test program, the average hourly test input rates have been verified to be within one standard deviation of the 2016 average, or between 57.60 and 79.94 (or greater) net tons per hour (tph). As the input rate falls within this range (actual value of 59.2 tph), the engines are considered to have been tested at their maximum normal operating loading condition. Documentation of the throughput for the test program is presented in Appendices A4 and B4 for Engine Nos. 1 and 2, respectively.

3.0 SOURCE AND SAMPLING POINT DESCRIPTIONS

3.1 Source Descriptions

Specification summaries for the engines tested during this test program are presented in Table 3-1. In addition, pictures of the Engine Nos. 1 and 2 test locations are presented in Figures 3-1 and 3-2, respectively.

Table 3-1 Engine Specifications – Engine Nos. 1 and 2

Source	Model No.	Serial No.	Approx. date of construction	Output (bhp)
Caterpillar Diesel Engine No. 1	3516	71Z00261	Nov. 1987	1665
Caterpillar Diesel Engine No. 2	3516	71Z00289	June 1990	1355

3.2 Sampling Point Description - Inlet

All inlet sampling was conducted in ports that were installed prior to the catalyst. As discussed onsite with the MassDEP representative, traversing these test locations was not possible due to safety concerns while the engines were operating. As such, sampling for each inlet was conducted in the centroidal area.

3.3 Sampling Point Description - Outlet

All outlet sampling was conducted in test ports installed following the catalyst. The test ports were located at least 2 equivalent diameters downstream of the catalyst and at least 2 equivalent diameters upstream of the horizontal stack exit. A stratification check was performed at each outlet stack location in accordance with EPA Method 7E by conducting a three point stratification check (16.7, 50.0, and 83.3 % diameter).

Figure 3-1 Picture of Test Location – Engine No. 1

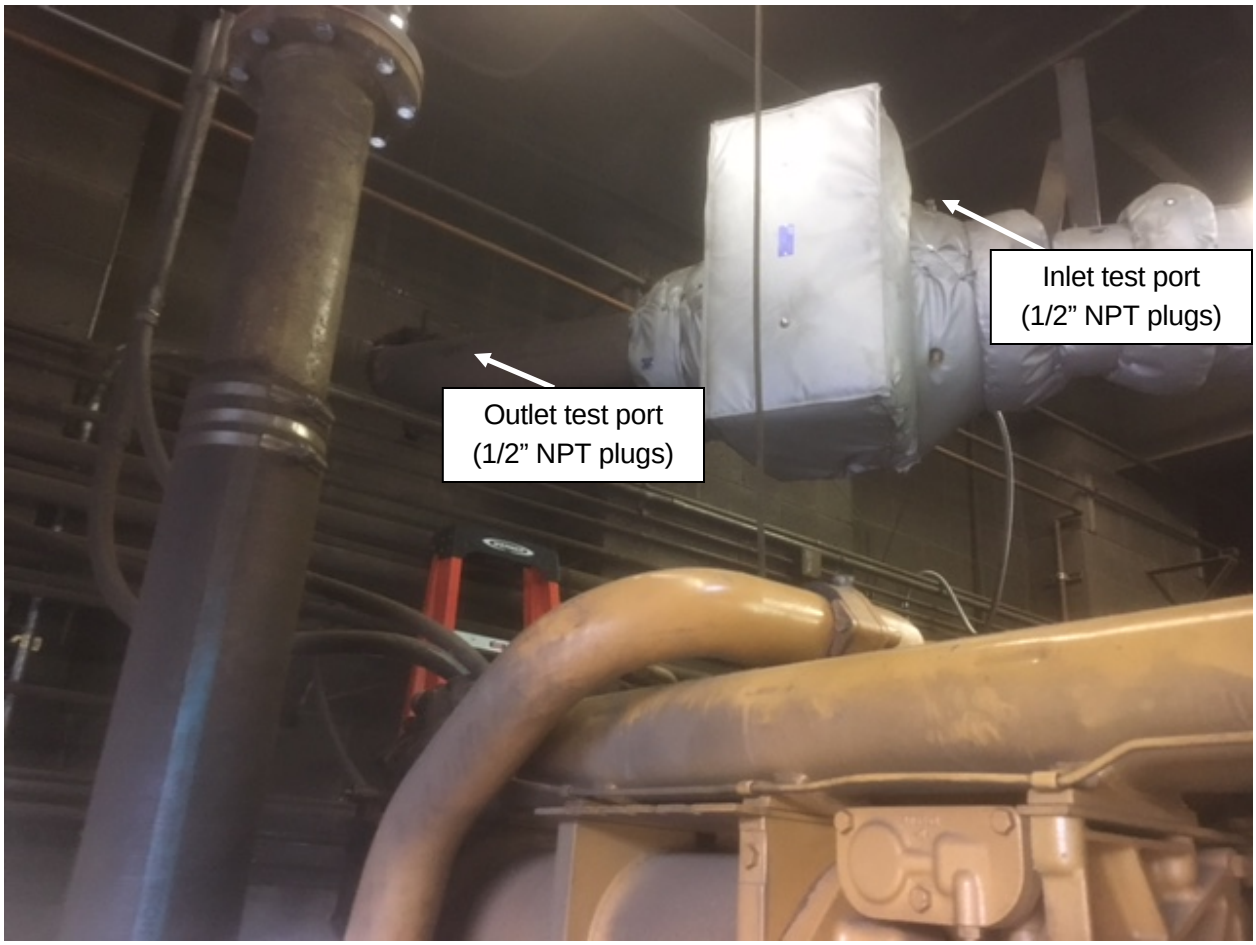
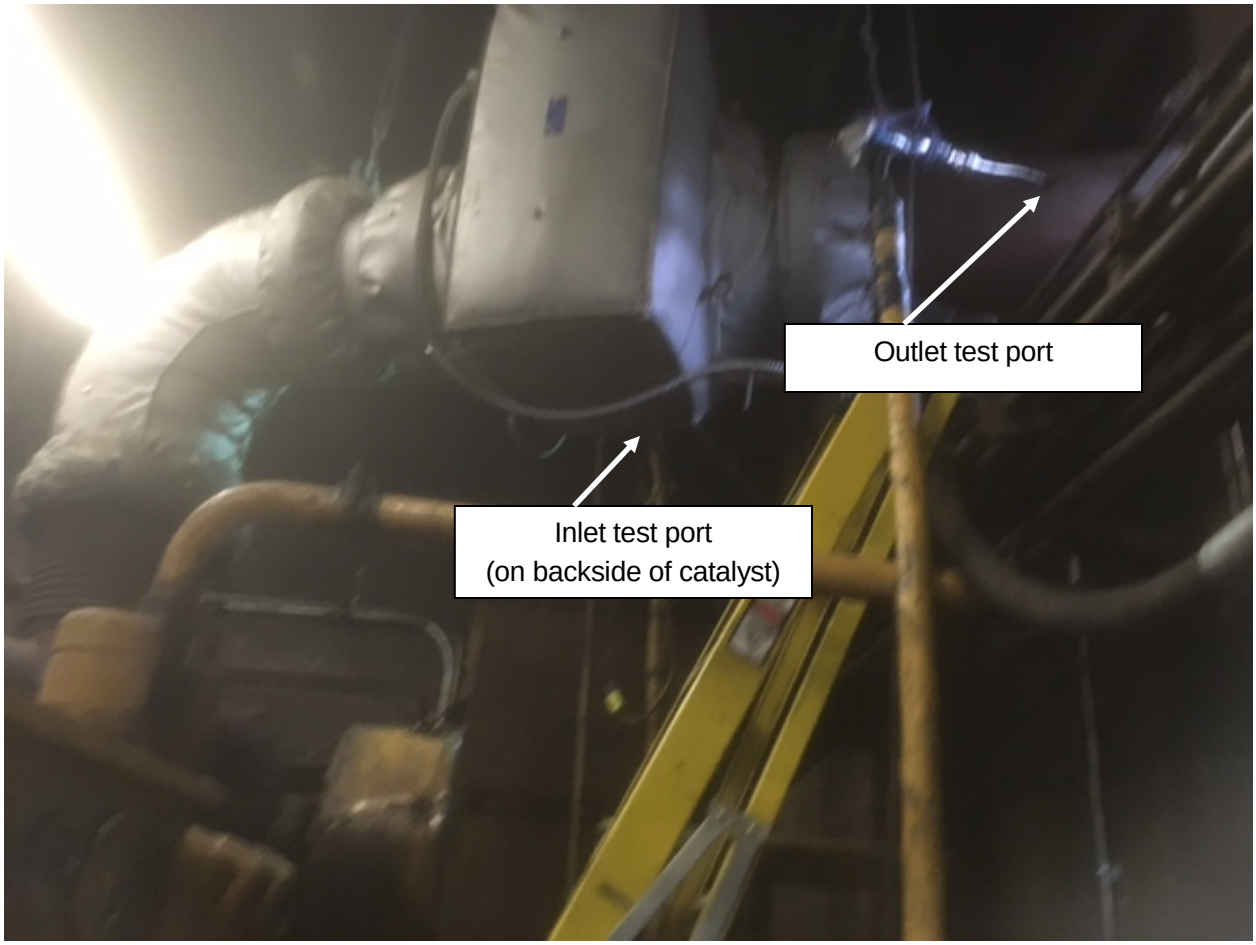


Figure 3-2 Picture of Test Location – Engine No. 2



4.0 TEST PROCEDURES

4.1 Overview

This test program consisted of conducting a set of three test runs for each of two engines while the respective units were operated at maximum normal operating conditions. Each test run required CO emissions to be calculated on a ppmvd@15% O_2 basis. The following subsections address the specifics of each test methodology that were adhered to throughout the test program.

4.2 CEMS Test Procedures

This section outlines all procedures associated with the CEMS portion of the test program.

4.2.1 CEMS Sampling and Calibration Procedures

The reference method CEMS analyzers were calibrated through both a direct and system calibration procedure in order to ensure the validity of all data collected. First, each instrument was calibrated directly (not through the system) with zero and two upscale points, as follows:

1. Deliver zero gas to respective analyzers until stable response is obtained, then adjust each analyzers zero potentiometer or equivalent to read as close to zero as possible.

2. Deliver span (highest value) gas to respective analyzers until stable response is obtained, then adjust each instruments span potentiometer or equivalent to read as close to the cylinder value as possible.

3. Deliver mid-level gas to respective analyzers until stable response is obtained, then calculate if the observed value meets 2% linearity criteria specified by the method. If the calibration meets the linearity criteria, then proceed to system calibration procedures. Otherwise, take corrective action and repeat direct calibration procedures for analyzers not meeting the linearity criteria.

Following a successful direct calibration of the instruments a system calibration was conducted, as follows:

4. Deliver zero gas through the entire sampling system, record the respective analyzer responses and calculate the respective analyzers calibration biases.

5. Deliver a representative upscale calibration gas through the entire system, record the respective analyzer responses and calculate the respective analyzers calibration biases.

If initial bias criteria were satisfactorily met, a sampling run was initiated following a sufficient purge of the sampling line with stack gas (a minimum of twice the system response time). Following each sampling run a subsequent system calibration was conducted as follows:

6. Deliver zero gas through the entire sampling system, record the respective analyzer response and calculate the respective analyzers calibration drift and biases.

7. Deliver a representative upscale (same gas cylinder as step 5) calibration gas through the entire system, record the respective analyzer responses and calculate the respective analyzers calibration drift and biases.

If all linearity, calibration drift, and calibration bias criteria were met then the collected data was considered valid. Each test run was required to be bracketed by system calibrations. If calibration criteria were not met, the data collected would not be considered valid, corrective action would have been taken and all calibration steps would have been repeated.

4.2.2 Pollutant/Diluent Monitoring

In general, the sample was extracted, analyzed, and recorded in accordance with the applicable instrumental analyzer procedures. All calibrations were conducted utilizing EPA Protocol gases. The results of calibrations were used to determine the acceptability of the test data. Each analyzer used during this test program is detailed below.

4.2.2.1 Oxygen

During this test program, oxygen was monitored in accordance with EPA Method 3A, 40 CFR 60, Appendix A. Montrose complied with instrumental analyzer procedure 3A utilizing both a California Analytical Instruments (CAI) Model 600 paramagnetic oxygen analyzer operated on a 0-25% range, as well as a Teledyne Model 326A micro fuel cell analyzer also operated on a 0-25% range.

4.2.2.2 Carbon Monoxide

Carbon Monoxide emissions were monitored in accordance with EPA Method 10, 40 CFR 60, Appendix A. Montrose complied with Method 10 utilizing two TECO Model 48 NDIR analyzers operated on either a 0-100ppm (outlet) 0-1,000ppm (inlet) range.

4.2.3 CEMS Sampling System Description

What follows is a description of the reference method CEMS that was used to quantify each of the diluents/pollutants during this test program.

4.2.3.1 Sample Delivery and Conditioning System

- Sample Probe – An unheated stainless steel probe of sufficient length to reach the required sampling points.
- Filter - A spun glass fiber filter contained in a heated sheath. The filter is located between the sample probe and sample line, it is designed to remove particulate from the gas stream.
- Sample Line - 3/8" Teflon tubing in a heated sample line designed to transport the sample gas from the probe to the sample conditioning system (in the CEMS trailer).
- Condenser – A thermo-electrically designed chiller is located just prior to the main sample pump. It is designed to reduce the dew point of the gas stream to 40 degrees F.
- Sample Pump - A diaphragm type vacuum pump to draw gas from the probe through the conditioning system and to the analyzers. The pump head is stainless steel, the valve disks are Viton and the diaphragm is Teflon coated.
- Sample Distribution System - A series of flow meters, valves and backpressure regulators allows the operator to maintain constant flow and pressure conditions during sampling and calibration.

4.2.3.2 Calibration System

- Calibration Gases – EPA Protocol Gases certified in accordance with EPA Protocol G1 procedures.

- Calibration System - A series of manual valves designed to deliver a specified gas either directly to an analyzer or through the entire sampling system by activating the appropriate valve sequence.
- Calibration Line – Teflon line (1/4") run in parallel to the sample line.
- Calibration Tee - Stainless steel tee (3/8") located between the probe and the filter that allows the operator to inject calibration gas through the entire sampling system. Excess calibration gas exits the probe eliminating any potential over pressurization.

4.2.3.3 Data Acquisition System

- Computer – A Dell Inspiron 1720

- Software – Iotech data acquisition system (DAQ 56). This system is programmed to collect data once per every two seconds, while reporting 1-minute averages. This software operates in a Windows environment.

5.0 QUALITY ASSURANCE / QUALITY CONTROL

5.1 Overview

Montrose Air Quality Services (MAQS), its management, and employees are committed to consistently providing the highest quality services to our clients that is delivered with honesty and integrity. These services result in data that are accurate, precise, timely, and legally defensible in support of our clients' environmental compliance, engineering evaluation, and other needs. A corporate culture of quality and continuous improvement is maintained as a positive and desirable aspect of business operations.

Both qualitative and quantitative factors contribute to field measurement uncertainty and should be taken into consideration when interpreting test program results. Whenever possible, Montrose personnel reduce the impact of these uncertainty factors through the use of approved and validated test methods. In addition, Montrose personnel perform routine instrument and equipment calibrations and ensure that the calibration standards, instruments, and equipment used during test events meet, at a minimum, test method specifications as well as the specifications of our Quality Manual and ASTM D 7036-04. Limitations of the various methods, instruments, equipment, and materials to be utilized during this test have been reasonably considered, but the ultimate impact of the cumulative uncertainty to the final data may not be quantifiable.

All calculations were conducted in strict accordance with the equations found in the individual Methods. Strict QA/QC protocols were followed during all phases of this project. These protocols included:

- QA objectives for measurement data;
- Data reduction;
- Internal QC;
- Calibration of equipment;
- Corrective action, if necessary; and
- Use of standardized field data sheets.

These specific procedures in addition to Montrose's usual high standard of quality control aid to validate the results obtained during this test program. As the majority of our emissions testing work are done for compliance purposes, strict QC procedures are incorporated into our everyday work performance.

The remainder of this section summarizes specific quality assurance aspects of the test program.

5.2 CEMS QA

Specific procedures were followed to ensure the validity of the CEMS data collected for this task. The following subsections outline the specific procedures and performance criteria that were utilized to maintain quality assurance throughout the program.

5.2.1 Leak Check

Prior to the initiation of testing, the CEMS was leak checked from the end of the sampling probe by ensuring that the system vacuum reaches the capacity of the sampling pump (~20"Hg) while all rotameters indicate no flow. If a leak were detected, it would be traced, fixed and the leak check procedure would be repeated until successful.

5.2.2 System Response Time

Prior to the initiation of sampling, a Reference Method (RM) CEMS response time was determined. During the test program, the reference method CEMS was allowed to sample a minimum of 2.0 times the RM CEMS response time prior to the initiation of any sampling runs.

5.2.3 Calibration Gases

All calibration gases utilized were prepared according to EPA Protocol G1 quality standards. The cylinder gas certification sheets supplied by the vendor are presented in Appendix C2.

5.2.4 Calibration Criteria

The following subsections present the CEMS criteria that were adhered to throughout the conduct of the test program.

- Analyzer Calibration Error (ACE) – At the beginning of each test day, an analyzer calibration error (direct calibration) was conducted for each analyzer by introducing zero and an upscale calibration gas upstream from the respective analyzers and calibrating the respective analyzers to the corresponding calibration gas value. A mid-range gas was then injected to the respective analyzers in order to demonstrate linearity. The maximum allowable calibration error is 2% of instrument span. If this limit were not achieved, corrective action would be taken and the procedure would be repeated until successful. Analyzer calibration error is calculated as follows:

$$ACE = \frac{(C_{Dir} - C_v)}{CS} \times 100$$

Where:

C_{Dir} = Measured concentration of a calibration gas (low, mid, or high) when introduced in direct calibration mode, ppmvd.

C_v = Manufacturer certified concentration of a calibration gas (low, mid, or high), ppmvd.

CS = Calibration span, ppmvd.

- Sampling System Bias (SB) – Following the performance of the analyzer calibration error, a system bias check was conducted by introducing sampling gas through the entire sampling system (system calibration) and comparing the response of the analyzer calibration error with that of the system calibration. The maximum allowable calibration error is 5% of instrument span. If this limit were not achieved, the test run would be voided and corrective action would be taken. If analyzer adjustments were made the analyzer calibration error and system bias checks would be repeated until the calibration met the EPA Method 7E criteria. System bias is calculated as follows:

$$SB = \frac{(C_s - C_{Dir})}{CS} \times 100$$

Where:

C_s = Measured concentration of a calibration gas (low, mid, or high) when introduced in system calibration mode, ppmvd.

- Calibration Drift (D) – Prior to and following each test run a system calibration was conducted in order to determine calibration drift during each test period. The maximum allowable calibration drift is 3% of instrument span. If the calibration drift were exceeded, corrective action would have be taken. If any analyzer adjustments were made, a new analyzer calibration error and system bias check would be conducted. Calibration drift is calculated as follows:

$$D = \left| SB_{final} - SB_{iniital} \right| \times 100$$

5.2.5 Calibration Drift and System Bias Correction

Each instrumental analyzer method requires the correction of CEMS data for the system bias and calibration drift observed over each test period. All run averages were corrected for system bias and calibration drift as follows:

$$C_{Gas} = (C_{Avg} - C_o)\left[\frac{C_{MA}}{C_M - C_o}\right]$$

Where:

C_{Gas} = Average effluent gas concentration adjusted for bias, ppmvd.

C_{Avg} = Average unadjusted gas concentration indicated by data recorder for test run.

C_o = Average of initial and final system calibration bias (or 2-point system calibration error) check responses from the low-level (or zero) calibration gas, ppmvd.

C_M = Average of initial and final system calibration bias (or 2-point system calibration error) check responses for the upscale calibration gas, ppmvd.

C_{MA} = Actual concentration of the upscale calibration gas, ppmvd.

5.2.1 Determination of Stratification

For each outlet test location, a determination of stratification was made in accordance with Section 8.1.2 of EPA Method 7E, 40CFR 60, Appendix A. As such, a single opening probe was traversed for 3-minutes/point at 16.7, 50 and 83.3 percent of the stack diameter. An average diluent or pollutant concentration was determined for each point and subsequently compared to the average pollutant concentration of all three points. If each point differed by no more than 5% or 0.5ppm (or 0.3% for O_2) from the mean pollutant concentration (whichever is less restrictive) then the gas stream was considered not stratified and sampling was conducted from the point which most closely matched the average concentration. If this criterion were not met but all points were within 10% or 1.0ppm (or 0.5% for O_2) then the gas stream was considered minimally stratified and testing was conducted at 3 points during each test run (16.7, 50 and 83.3% of stack diameter). If neither of these criteria were met the gas stream was considered stratified and testing was conducted in accordance with Table 1-1 or 1-2 of EPA Method 1 40CFR 60, Appendix A.

It should be noted, for this test program the most stringent criteria was met for each outlet (as previously noted traversing the inlet was not possible). Hence, a single point sampling strategy was employed. Copies of the stratification test results for both sources are presented in Appendix C1.

5.3 Emission Rate Calculations

The following equations were used in calculating emissions in units of applicable standard throughout the test program.

5.3.1 ppmvd@15%O_2 Emission Rate Calculation

Emissions (ppmvd) corrected to 15%O_2 basis was calculated in accordance with the following equation.

$$E = C_d \left[\frac{5.9}{20.9 - \%O_{2d}} \right]$$

Where:

E = pollutant emission rate, ppmvd@15%O_2

Cd = pollutant concentration, ppmvd

%O_2d = Concentration of oxygen, %vd

5.3.1 Removal Efficiency Calculation

Removal Efficiency was determined utilizing the following equation.

$$R = [\frac{C_i - C_o}{C_i}] \times 100$$

Where:

R = percent reduction of CO emissions.

C_i = concentration of CO at the control device inlet

C_o = concentration of CO at the control device outlet

5.4 Equipment Calibrations

Montrose's pitot tubes, thermocouples and barometers are maintained in accordance with specifications set forth in EPA "Quality Assurance Handbook for Air Pollution Measurement Systems - Volume Ⅲ Stationary Source Specific Methods" and with manufacturer's suggested procedures. A summary is presented below:

- Thermocouples - All type K thermocouples are calibrated against an NIST-traceable digital thermometer at either two or three points, depending on the application of the thermocouple.

APPENDIX A

Emission Calculations and Field Data Sheets – Engine 1

Indices
1 - RM Emission Calculations and Field Data Sheets – Inlet
2 - RM Emission Calculations and Field Data Sheets – Outlet
3 - RM CEMS Monitoring Data – Inlet and Outlet
4 - Facility Process Data

Index A1 - RM Emission Calculations and Field Data Sheets – Engine 1, Inlet

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	10:32
Run No.:	R1-Inlet	**Stop Time:**	11:32

O_2,%vd = 9.74

CO,ppmvd (C_d) = 267.81

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 141.64 ppmvd@15%O_2

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	11:50
Run No.:	R2-Inlet	**Stop Time:**	12:50

O_2 %vd = 10.10

CO,ppmvd (C_d) = 232.95

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 127.23 ppmvd@15%O_2

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	13:05
Run No.:	R3-Inlet	**Stop Time:**	14:05

O_2,%vd = 9.54

CO,ppmvd (C_d) = 276.66

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 143.65 ppmvd@15%O_2

Analyzer Calibration Error Checks (ACE)

Facility / Site:	wTe Recycling Greenfield, MA	Date:	25-Apr-17
Source:	Engine 1		

Diluent/Pollutant	O_2		CO		
Monitor Range (Programmed)	25		200		
Monitor Range (Effective, per Method)	20.98		945		
--- Low Level Analyzer Calibration Error ---					
Cylinder Value	0.00		0.00		
Response	0.00		0.00		
ACE	0.00		0.00		
Calibration Status (Pass/Fail)	Pass		Pass		
--- Mid Level Analyzer Calibration Error ---					
Cylinder Value (Mid)	11.02		448.00		
Analyzer Response (Mid)	11.15		434.00		
ACE	0.62		-1.48		
Calibration Status (Pass/Fail)	Pass		Pass		
--- High Level Analyzer Calibration Error ---					
Cylinder Value (High/Span)	20.98		945.00		
Analyzer Response (High)	21.05		944.00		
ACE	0.33		-0.11		
Calibration Status (Pass/Fail)	Pass		Pass		
--- Mid Level Gas Range Assessment ---					
Cylinder Value (Mid)	11.02		448.00		
Cylinder Value (High/Span)	20.98		945.00		
Mid Level Gas (Percentage of Span)	52.5%		47.4%		
Calibration Gas Status (Pass/Fail)	Pass		Pass		
--- System Calibration Gas Selection ---					
Use Mid or High Span (M or H)	M		M		

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	10:32
Run No.:	R1-Inlet	**Stop Time:**	11:32

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	945
Analyzer Zero Response =	0.00	0.0
Analyzer Span Response =	11.15	434.0
Initial Sytem Zero Response =	0.10	0.2
Final System Zero Response =	0.15	0.5
Average Zero Response (C_o) =	0.13	0.4
Initial Sytem Span Response =	11.10	427.0
Final System Span Response =	11.15	429.0
Average Span Response (C_m) =	11.13	428.0
Calibration gas values (C_{ma}) =	11.02	448.0
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.48	0.02
Final Zero Bias (SB_{final}) =	0.71	0.05
Zero Drift (D) =	0.24	0.03
Initial Span Bias (SB_i) =	-0.24	-0.74
Final Span Bias (SB_{final}) =	0.00	-0.53
Span Drift (D) =	0.24	0.21
Uncorrected Ave. (C_{Avg}) =	9.85	255.99
Corrected Ave.=C_{gas} = (C_{Avg}-C_o)(C_{ma}/(C_m-C_o)) =	9.74	267.81

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	11:50
Run No.:	R2-Inlet	**Stop Time:**	12:50

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	945
Analyzer Zero Response =	0.00	0.0
Analyzer Span Response =	11.15	434.0
Initial Sytem Zero Response =	0.15	0.5
Final System Zero Response =	0.15	0.5
Average Zero Response (C_o) =	0.15	0.5
Initial Sytem Span Response =	11.15	429.0
Final System Span Response =	11.10	427.0
Average Span Response (C_m) =	11.13	428.0
Calibration gas values (C_{ma}) =	11.02	448.0
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.71	0.05
Final Zero Bias (SB_{final}) =	0.71	0.05
Zero Drift (D) =	0.00	0.00
Initial Span Bias (SB_i) =	0.00	-0.53
Final Span Bias (SB_{final}) =	-0.24	-0.74
Span Drift (D) =	0.24	0.21
Uncorrected Ave. ($\overline{C_{Avg}}$) =	10.21	222.79
Corrected Ave.=C_{gas} = (C_{Avg}-C_o)(C_{ma}/(C_m-C_o)) =	10.10	232.95

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	13:05
Run No.:	R3-Inlet	**Stop Time:**	14:05

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	945
Analyzer Zero Response =	0.00	0.0
Analyzer Span Response =	11.15	434.0
Initial Sytem Zero Response =	0.15	0.5
Final System Zero Response =	0.15	0.6
Average Zero Response (C_o) =	0.15	0.6
Initial Sytem Span Response =	11.10	427.0
Final System Span Response =	11.15	429.0
Average Span Response (C_m) =	11.13	428.0
Calibration gas values (C_{ma}) =	11.02	448.0
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.71	0.05
Final Zero Bias (SB_{final}) =	0.71	0.06
Zero Drift (D) =	0.00	0.01
Initial Span Bias (SB_i) =	-0.24	-0.74
Final Span Bias (SB_{final}) =	0.00	-0.53
Span Drift (D) =	0.24	0.21
Uncorrected Ave. ($\overline{C_{Avg}}$) =	9.65	264.52
Corrected Ave.=C_{gas} = (C_{Avg}-$\overline{C_o}$)(C_{ma}/(C_m-C_o)) =	9.54	276.66

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling Greenfield, NH
Source: Engine 1 - Inlet
RM Response Time:
Upscale (seconds): 30

Operator: D Carr
Date: 4/25/17
Downscale (seconds): 30

Note: System Response Time is the longer of the upscale and downscale response times. Performed during initial zero and bias checks.

Analyzer Calibration Error (ACE) – Reference Method (best of day)

Pollutant/Diluent	Analyzer ID	Low		Mid		High/Full Scale (CS)	
		Cylinder Value (C_v)	Analyzer Response (C_{DIR})	Cylinder Value (C_v)	Analyzer Response (C_{DIR})	Cylinder Value (C_v)	Analyzer Response (C_{DIR})
O_2	CAI 600	0.00	0.00	11.02	11.15	20.58	21.05
CO	TECO 48C	0.0	0.0	448	434	945	944

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		1,000		

Protocol Gases Used During Program:

Cylinder No.	Diluent/Pollutant Concentrations(s)	Expiration Date
EB0067341	O_2 - 11.02%	
EB0068441	O_2 - 20.58%	
EB0060772	CO - 448 ppm	
EB0069732	CO - 945 ppm	

Analyzer Calibration Error (ACE) Acceptance Criteria: ≤ ± 2%

Where: ACE = $[(C_{Dir} - C_v)/CS] * 100\%$

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling
Source: EU1 - Inlet D

Operator: P Curran
Date: 4/25/17

Run Number: Eng 1 - R1 - Inlet
Start Time: 1032
End Time: 1132

O_2 - 9.85
CO - 255.99

System Bias (SB)/Drift (D) Assessments – Reference Method

Eng 1 - R1 (I) Eng 1 - R1 (F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.10	11.02	11.10	0.00	0.15	11.02	11.15
CO	0.0	0.2	448	427	0.00	0.5	448	429

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		1,000		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where

Where: $SB = [(C_S - C_{DA})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling Greenfield, MA Operator: D Curran
Source: Engine 1 - Inlet Date: 4/25/17

Run Number: Eng 1 - R2 - Inlet
Start Time: 1150
End Time: 1250

R2 O_2 – 10.21
CO – 222.79

System Bias (SB)/Drift (D) Assessments – Reference Method

Eng 1-R2(I) Eng 1-R2(F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.15	11.02	11.15	0.00	0.15	11.02	11.10
CO	0.0	0.5	448	429	0.00	0.5	448	427

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		1,000		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: $SB = [(C_s - C_{Dir})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling Greenfield, MA
Source: Engine 1 - 6 Inlet
Operator: D Carey
Date: 4/25/17

Run Number: R3 - 6 Inlet
Start Time: 1305
End Time: 1405

R3 O_2 - 9.65
CO - 264.5 2

System Bias (SB)/Drift (D) Assessments – Reference Method

R3(I) R3(F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.15	11.02	11.10	0.00	0.15	11.02	11.15
CO	0.0	0.5	448	427	0.00	0.6	448	429

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		1,000	1	

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: SB = $[(C_s - C_{Dir})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

Index A2 - RM Emission Calculations and Field Data Sheets – Engine 1, Outlet

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	10:32
Run No.:	R1-Outlet	**Stop Time:**	11:32

O_2 %vd =	9.70
CO,ppmvd (C_d) =	32.96

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 17.37 ppmvd@15%O_2

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	11:50
Run No.:	R2-Outlet	**Stop Time:**	12:50

O_2,%vd =	10.09
CO,ppmvd (C_d) =	31.18

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 17.01 ppmvd@15%O_2

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	13:05
Run No.:	R3-Outlet	**Stop Time:**	14:05

O_2,%vd =	9.47
CO,ppmvd (C_d) =	34.68

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 17.91 ppmvd@15%O_2

Analyzer Calibration Error Checks (ACE)

Facility / Site:	wTe Recycling Greenfield, MA	Date:	25-Apr-17
Source:	Engine 1		

Diluent/Pollutant	O_2		CO		
Monitor Range (Programmed)	25		100		
Monitor Range (Effective, per Method)	20.98		92		
--- Low Level Analyzer Calibration Error ---					
Cylinder Value	0.00		0.00		
Response	0.10		0.00		
ACE	0.48		0.00		
Calibration Status (Pass/Fail)	Pass		Pass		
--- Mid Level Analyzer Calibration Error ---					
Cylinder Value (Mid)	11.02		45.30		
Analyzer Response (Mid)	10.85		45.30		
ACE	-0.81		0.00		
Calibration Status (Pass/Fail)	Pass		Pass		
--- High Level Analyzer Calibration Error ---					
Cylinder Value (High/Span)	20.98		92.00		
Analyzer Response (High)	21.00		91.90		
ACE	0.10		-0.11		
Calibration Status (Pass/Fail)	Pass		Pass		
--- Mid Level Gas Range Assessment ---					
Cylinder Value (Mid)	11.02		45.30		
Cylinder Value (High/Span)	20.98		92.00		
Mid Level Gas (Percentage of Span)	52.5%		49.2%		
Calibration Gas Status (Pass/Fail)	Pass		Pass		
--- System Calibration Gas Selection ---					
Use Mid or High Span (M or H)	M		M		

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	10:32
Run No.:	R1-Outlet	**Stop Time:**	11:32

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	92
Analyzer Zero Response =	0.10	0.0
Analyzer Span Response =	10.85	45.3
Initial Sytem Zero Response =	0.15	0.2
Final System Zero Response =	0.10	0.0
Average Zero Response (C_o) =	0.13	0.1
Initial Sytem Span Response =	11.10	46.0
Final System Span Response =	11.15	45.3
Average Span Response (C_m) =	11.13	45.7
Calibration gas values (C_{ma}) =	11.02	45.3
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.24	0.22
Final Zero Bias (SB_{final}) =	0.00	0.00
Zero Drift (D) =	0.24	0.22
Initial Span Bias (SB_i) =	1.19	0.76
Final Span Bias (SB_{final}) =	1.43	0.00
Span Drift (D) =	0.24	0.76
Uncorrected Ave. (C_{Avg}) =	9.81	33.25
Corrected Ave.=C_{gas} = (C_{Avg}-C_o)(C_{ma}/(C_m-C_o)) =	9.70	32.96

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	11:50
Run No.:	R2-Outlet	**Stop Time:**	12:50

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	92
Analyzer Zero Response =	0.10	0.0
Analyzer Span Response =	10.85	45.3
Initial Sytem Zero Response =	0.10	0.0
Final System Zero Response =	0.10	-0.5
Average Zero Response (C_o) =	0.10	-0.3
Initial Sytem Span Response =	11.15	45.3
Final System Span Response =	11.00	45.0
Average Span Response (C_m) =	11.08	45.2
Calibration gas values (C_{ma}) =	11.02	45.3
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.00	0.00
Final Zero Bias (SB_{final}) =	0.00	-0.54
Zero Drift (D) =	0.00	0.54
Initial Span Bias (SB_i) =	1.43	0.00
Final Span Bias (SB_{final}) =	0.71	-0.33
Span Drift (D) =	0.71	0.33
Uncorrected Ave. ($\overline{C_{Avg}}$) =	10.15	31.00
Corrected Ave.=C_{gas} = (C_{Avg}-C_o)(C_{ma}/(C_m-C_o)) =	10.09	31.18

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/25/17
Source:	Engine 1	**Start Time:**	13:05
Run No.:	R3-Outlet	**Stop Time:**	14:05

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	92
Analyzer Zero Response =	0.10	0.0
Analyzer Span Response =	10.85	45.3
Initial Sytem Zero Response =	0.10	-0.5
Final System Zero Response =	0.10	-0.2
Average Zero Response (C_o) =	0.10	-0.4
Initial Sytem Span Response =	11.00	45.0
Final System Span Response =	11.10	44.7
Average Span Response (C_m) =	11.05	44.9
Calibration gas values (C_{ma}) =	11.02	45.3
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.00	-0.54
Final Zero Bias (SB_{final}) =	0.00	-0.22
Zero Drift (D) =	0.00	0.33
Initial Span Bias (SB_i) =	0.71	-0.33
Final Span Bias (SB_{final}) =	1.19	-0.65
Span Drift (D) =	0.48	0.33
Uncorrected Ave. ($\overline{C_{Avg}}$) =	9.51	34.26
Corrected Ave.=C_{gas} = ($\overline{C_{Avg}}$-C_o)(C_{ma}/(C_m-C_o)) =	9.47	34.68

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling / Greenfield, MA
Source: Engine 1 – Outlet
RM Response Time: Upscale (seconds): 30

Operator: D Curran
Date: 4/25/17
Downscale (seconds): 30

Note: System Response Time is the longer of the upscale and downscale response times. Performed during initial zero and bias checks:

Analyzer Calibration Error (ACE) – Reference Method (beg of day)

Pollutant/Diluent	Analyzer ID	Low		Mid		High/Full Scale (CS)	
		Cylinder Value (C_v)	Analyzer Response (C_{DIR})	Cylinder Value (C_v)	Analyzer Response (C_{DIR})	Cylinder Value (C_v)	Analyzer Response (C_{DIR})
O2	Teledyne O2 #2	0.00	0.10	11.02	10.85	20.98	21.02
CO	TECO 48 #1	0.0	0.0	45.3	45.3	~~92.0~~	91.9

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100		

Protocol Gases Used During Program:

Cylinder No.	Diluent/Pollutant Concentrations(s)	Expiration Date
EB0067 34	O2 – 11.02 %	
EB0068441	O2 – 20.98 %	
SG9161410	CO – 45.3 ppm	
SG9169499	CO – 92.0 ppm	

Analyzer Calibration Error (ACE) Acceptance Criteria: ≤ ± 2%

Where: ACE = $[(C_{Dir} - C_v)/CS] * 100\%$

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTR Recycling Greenfield, MA
Source: Eng 1 outlet
Operator: DCare
Date: 4/25/17

Run Number: Eng 1 - R1 - out
Start Time: 1032
End Time: 1132

START
move to pt 1 @ 935
940
945

R1 O_2 - 9.81
CO - 33.25

System Bias (SB)/Drift (D) Assessments – Reference Method

START / R1 (I)

START / R1 (F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.15	11.02	11.10	0.00	0.10	11.02	11.15
CO	0.0	0.2	45.3	46.0	0.00	0.0	45.3	45.3

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100ppm		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: SB = $[(C_s - C_{Dir})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

MONTROSE
AIR QUALITY SERVICES

Client/Site: ~~wTe Recycling Greenfield, MA~~ Operator: D. Caron

Source: ~~Eng 1 outlet~~ Date: 4/25/17

Run Number: Eng 1 - R2-05T

Start Time: 1150

End Time: 1250

R2 O_2 - ~~10.21~~ 10.15 (2R)

CO - ~~222.79~~ 31.00 (2R)

System Bias (SB)/Drift (D) Assessments – Reference Method

R2(I) R2(F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.10	11.02	11.15	0.00	0.10	11.02	11.00
CO	0.0	0.0	45.3	45.3	0.0	-0.5	45.3	45.0

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: $SB = [(C_s - C_{Dv})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling Greenfield, MN Operator: D Cuva

Source: Engine outlet Date: 4/25/17

Run Number: R3 - outlet

Start Time: 1305

End Time: 1405

R3 O_2 - 9.51
CO - 34.26

System Bias (SB)/Drift (D) Assessments – Reference Method

R3 (I) R3 (F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.10	11.02	11.00	0.00	0.10	11.02	11.10
CO	0.00	-0.5	45.3	45.0	0.00	-0.2	45.3	44.7

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: $SB = [(C_s - C_{Dv})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{brief} - SB|$

Index A3 - RM CEMS Monitoring Data – Engine 1, Inlet and Outlet

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,		Date: 04/25/17	
Source:	Engine 1		Start Time: 10:32	
Run No.:	Run 1		Stop Time: 11:32	
Date/time	O_2-Inlet ($\%_{vd}$)	CO - Inlet (ppmvd)	O_2-Outlet ($\%_{vd}$)	CO - outlet (ppmvd)
4/25/2017 10:32:09 AM	10.17	219.79	11.30	24.10
4/25/2017 10:33:09 AM	9.15	452.64	9.10	61.20
4/25/2017 10:34:09 AM	9.60	343.38	9.60	44.10
4/25/2017 10:35:09 AM	9.64	286.09	9.60	38.10
4/25/2017 10:36:09 AM	9.47	279.89	9.50	35.50
4/25/2017 10:37:09 AM	9.63	294.96	9.60	35.80
4/25/2017 10:38:09 AM	9.59	285.17	9.50	35.10
4/25/2017 10:39:09 AM	10.17	249.41	10.10	31.90
4/25/2017 10:40:09 AM	9.93	191.58	10.10	27.90
4/25/2017 10:41:09 AM	9.71	254.44	9.60	33.20
4/25/2017 10:42:09 AM	9.90	239.86	9.90	30.90
4/25/2017 10:43:09 AM	9.13	302.74	9.00	37.20
4/25/2017 10:44:09 AM	9.31	332.82	9.40	35.90
4/25/2017 10:45:09 AM	9.37	335.02	9.20	38.40
4/25/2017 10:46:09 AM	9.95	284.76	9.90	33.60
4/25/2017 10:47:09 AM	9.37	268.58	9.20	33.50
4/25/2017 10:48:09 AM	10.14	273.72	10.20	32.10
4/25/2017 10:49:09 AM	9.58	222.42	9.60	29.70
4/25/2017 10:50:09 AM	9.08	318.80	9.00	36.90
4/25/2017 10:51:09 AM	9.55	343.71	9.40	37.30
4/25/2017 10:52:09 AM	9.79	256.24	9.90	30.80
4/25/2017 10:53:09 AM	9.42	276.79	9.40	33.60
4/25/2017 10:54:09 AM	10.02	275.77	9.70	33.10
4/25/2017 10:55:09 AM	10.26	216.00	10.30	26.20
4/25/2017 10:56:09 AM	10.98	261.27	10.80	30.30
4/25/2017 10:57:09 AM	9.72	211.77	9.80	31.70
4/25/2017 10:58:09 AM	9.14	282.39	9.20	36.30
4/25/2017 10:59:09 AM	9.48	337.50	9.30	39.10
4/25/2017 11:00:09 AM	9.43	298.64	9.30	37.00
4/25/2017 11:01:09 AM	10.18	245.23	10.00	31.30
4/25/2017 11:02:09 AM	10.14	194.45	10.10	29.60
4/25/2017 11:03:09 AM	9.73	205.69	9.70	30.60
4/25/2017 11:04:09 AM	9.77	219.98	9.90	30.10
4/25/2017 11:05:09 AM	10.57	308.87	10.20	35.60
4/25/2017 11:06:09 AM	9.96	185.54	10.00	27.70
4/25/2017 11:07:09 AM	10.23	197.74	10.10	30.20
4/25/2017 11:08:09 AM	9.88	196.79	9.90	30.50

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,	Date: 04/25/17		
Source:	Engine 1	Start Time: 10:32		
Run No.:	Run 1	Stop Time: 11:32		
Date/time	O_2.Inlet ($\%_{vd}$)	CO - Inlet (ppmvd)	O_2.Outlet ($\%_{vd}$)	CO - outlet (ppmvd)
4/25/2017 11:09:09 AM	9.83	223.86	9.80	32.50
4/25/2017 11:10:09 AM	10.10	220.23	10.00	32.60
4/25/2017 11:11:09 AM	9.95	202.73	10.00	30.90
4/25/2017 11:12:09 AM	9.64	219.47	9.60	31.80
4/25/2017 11:13:09 AM	9.52	260.35	9.50	34.90
4/25/2017 11:14:09 AM	9.43	267.81	9.40	34.50
4/25/2017 11:15:09 AM	9.82	288.08	9.60	36.90
4/25/2017 11:16:09 AM	9.90	221.58	9.90	31.20
4/25/2017 11:17:09 AM	9.67	234.83	9.60	33.50
4/25/2017 11:18:09 AM	9.68	256.44	9.50	35.20
4/25/2017 11:19:09 AM	9.82	237.50	9.70	33.30
4/25/2017 11:20:09 AM	10.11	215.37	10.10	30.00
4/25/2017 11:21:09 AM	10.29	245.02	10.30	33.20
4/25/2017 11:22:09 AM	9.42	232.17	9.40	33.60
4/25/2017 11:23:09 AM	9.90	265.08	9.70	33.90
4/25/2017 11:24:09 AM	10.18	228.29	10.10	31.30
4/25/2017 11:25:09 AM	9.73	215.54	9.70	32.00
4/25/2017 11:26:09 AM	9.78	242.77	9.70	33.00
4/25/2017 11:27:09 AM	13.54	185.90	12.50	25.80
4/25/2017 11:28:09 AM	10.76	132.05	11.60	16.10
4/25/2017 11:29:09 AM	9.77	231.19	9.70	32.50
4/25/2017 11:30:09 AM	9.54	256.24	9.60	33.00
4/25/2017 11:31:09 AM	9.57	326.55	9.20	37.00
Run Averages:	**9.85**	**255.99**	**9.81**	**33.25**

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,		Date: 04/25/17	
Source:	Engine 1		Start Time: 11:50	
Run No.:	R2		Stop Time: 12:50	
Date/time	O_2.Outlet ($\%_{vd}$)	CO - outlet (ppmvd)	O_2.Inlet ($\%_{vd}$)	CO - inlet (ppmvd)
4/25/2017 11:50:09 AM	9.34	369.05	9.30	46.70
4/25/2017 11:51:09 AM	9.75	297.44	9.70	38.60
4/25/2017 11:52:09 AM	9.86	249.05	9.90	35.20
4/25/2017 11:53:09 AM	10.17	230.76	10.10	33.80
4/25/2017 11:54:09 AM	11.39	159.35	11.40	25.60
4/25/2017 11:55:09 AM	9.08	221.70	9.20	31.50
4/25/2017 11:56:09 AM	9.74	375.59	9.70	40.50
4/25/2017 11:57:09 AM	9.83	246.46	9.80	33.50
4/25/2017 11:58:09 AM	9.99	221.27	10.10	31.80
4/25/2017 11:59:09 AM	10.34	214.77	10.30	31.70
4/25/2017 12:00:09 PM	9.80	203.05	9.80	31.00
4/25/2017 12:01:09 PM	9.89	226.58	9.90	32.40
4/25/2017 12:02:09 PM	10.45	200.46	10.50	30.60
4/25/2017 12:03:09 PM	9.37	224.53	9.40	33.10
4/25/2017 12:04:09 PM	10.36	252.61	10.30	33.10
4/25/2017 12:05:09 PM	9.78	188.88	10.00	29.20
4/25/2017 12:06:09 PM	9.23	342.79	9.00	40.40
4/25/2017 12:07:09 PM	9.94	273.32	9.90	32.40
4/25/2017 12:08:09 PM	9.97	209.96	10.00	30.70
4/25/2017 12:09:09 PM	9.95	214.10	9.90	31.20
4/25/2017 12:10:09 PM	9.68	221.19	9.90	31.70
4/25/2017 12:11:09 PM	10.27	274.35	10.00	34.80
4/25/2017 12:12:09 PM	10.10	194.02	10.20	28.80
4/25/2017 12:13:09 PM	10.15	194.30	10.00	29.70
4/25/2017 12:14:09 PM	11.53	169.81	11.30	26.20
4/25/2017 12:15:09 PM	12.30	106.14	11.90	18.30
4/25/2017 12:16:09 PM	15.81	98.51	15.20	12.50
4/25/2017 12:17:09 PM	15.19	131.42	16.20	10.50
4/25/2017 12:18:09 PM	9.76	285.20	9.60	37.60
4/25/2017 12:19:09 PM	9.77	255.18	10.00	32.70
4/25/2017 12:20:09 PM	9.95	247.86	9.80	33.50
4/25/2017 12:21:09 PM	10.45	201.68	10.40	29.10
4/25/2017 12:22:09 PM	9.76	207.28	9.70	29.40
4/25/2017 12:23:09 PM	9.65	293.73	9.70	35.20
4/25/2017 12:24:09 PM	9.84	255.99	9.70	33.40
4/25/2017 12:25:09 PM	9.93	225.39	9.90	31.00
4/25/2017 12:26:09 PM	9.94	213.44	9.90	30.00

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,		Date: 04/25/17		
Source:	Engine 1		Start Time: 11:50		
Run No.:	R2		Stop Time: 12:50		
Date/time	O_2.Outlet ($\%_{vd}$)	CO - outlet (ppmvd)	O_2.Inlet ($\%_{vd}$)	CO - Inlet (ppmvd)	
4/25/2017 12:27:09 PM	10.03	217.93	9.90	30.90	
4/25/2017 12:28:09 PM	9.93	207.77	9.90	30.30	
4/25/2017 12:29:09 PM	9.88	219.64	9.80	30.90	
4/25/2017 12:30:09 PM	9.88	223.68	9.80	31.20	
4/25/2017 12:31:09 PM	9.98	210.34	9.90	30.20	
4/25/2017 12:32:09 PM	9.86	220.73	9.70	31.40	
4/25/2017 12:33:09 PM	9.95	218.70	9.90	30.60	
4/25/2017 12:34:09 PM	9.99	212.54	9.80	30.70	
4/25/2017 12:35:09 PM	9.89	209.98	9.80	30.10	
4/25/2017 12:36:09 PM	10.22	216.12	9.90	30.80	
4/25/2017 12:37:09 PM	9.92	199.89	9.90	28.00	
4/25/2017 12:38:09 PM	10.30	253.94	10.20	32.60	
4/25/2017 12:39:09 PM	10.02	194.20	9.90	29.70	
4/25/2017 12:40:09 PM	10.18	202.98	10.00	30.40	
4/25/2017 12:41:09 PM	10.18	182.83	10.10	28.60	
4/25/2017 12:42:09 PM	10.21	188.19	10.00	29.70	
4/25/2017 12:43:09 PM	9.80	193.11	9.80	29.50	
4/25/2017 12:44:09 PM	9.80	248.58	9.60	34.40	
4/25/2017 12:45:09 PM	9.91	241.42	9.60	32.80	
4/25/2017 12:46:09 PM	10.09	206.83	10.00	29.80	
4/25/2017 12:47:09 PM	10.17	185.08	10.10	28.40	
4/25/2017 12:48:09 PM	9.92	206.60	9.70	31.00	
4/25/2017 12:49:09 PM	9.97	209.11	9.80	30.30	
Run Averages:	**10.21**	**222.79**	**10.15**	**31.00**	

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,	Date: 04/25/17		
Source:	Engine 1	Start Time: 13:05		
Run No.:	R3	Stop Time: 14:05		
Date/time	O_2 Outlet ($\%_{vd}$)	CO - outlet (ppmvd)	O_2 Inlet ($\%_{vd}$)	CO - Inlet (ppmvd)
4/25/2017 1:05:09 PM	9.91	230.60	9.60	33.40
4/25/2017 1:06:09 PM	9.33	249.48	9.30	34.00
4/25/2017 1:07:09 PM	9.44	316.13	9.30	38.80
4/25/2017 1:08:09 PM	9.91	249.51	9.80	32.50
4/25/2017 1:09:09 PM	9.02	266.95	8.90	35.00
4/25/2017 1:10:09 PM	9.59	365.66	9.30	40.70
4/25/2017 1:11:09 PM	9.92	246.02	9.80	32.00
4/25/2017 1:12:09 PM	9.47	237.31	9.40	33.00
4/25/2017 1:13:09 PM	9.35	291.11	9.30	36.50
4/25/2017 1:14:09 PM	9.65	304.05	9.40	37.30
4/25/2017 1:15:09 PM	9.64	261.10	9.50	34.60
4/25/2017 1:16:09 PM	9.54	250.07	9.50	33.30
4/25/2017 1:17:09 PM	9.69	274.49	9.40	35.70
4/25/2017 1:18:09 PM	10.06	218.68	10.00	30.40
4/25/2017 1:19:09 PM	9.78	220.85	9.70	32.70
4/25/2017 1:20:09 PM	9.68	245.49	9.50	34.10
4/25/2017 1:21:09 PM	9.82	238.17	9.70	33.00
4/25/2017 1:22:09 PM	10.06	222.41	9.90	31.90
4/25/2017 1:23:09 PM	9.82	198.08	9.80	30.30
4/25/2017 1:24:09 PM	9.12	281.06	9.00	37.10
4/25/2017 1:25:09 PM	9.08	346.52	9.00	39.90
4/25/2017 1:26:09 PM	9.14	353.85	9.00	39.70
4/25/2017 1:27:09 PM	9.37	330.91	9.10	38.40
4/25/2017 1:28:09 PM	9.60	289.49	9.40	35.60
4/25/2017 1:29:09 PM	9.42	261.22	9.40	33.70
4/25/2017 1:30:09 PM	9.40	302.51	9.20	37.00
4/25/2017 1:31:09 PM	9.48	280.24	9.30	34.70
4/25/2017 1:32:09 PM	9.35	298.88	9.30	37.00
4/25/2017 1:33:09 PM	9.41	291.02	9.20	36.00
4/25/2017 1:34:09 PM	9.40	289.65	9.20	35.90
4/25/2017 1:35:09 PM	9.50	287.58	9.30	35.90
4/25/2017 1:36:09 PM	9.27	293.79	9.20	36.30
4/25/2017 1:37:09 PM	9.20	308.72	9.10	37.00
4/25/2017 1:38:09 PM	9.85	310.58	9.60	36.60
4/25/2017 1:39:09 PM	10.21	209.51	10.10	29.60
4/25/2017 1:40:09 PM	9.66	189.64	9.70	29.20
4/25/2017 1:41:09 PM	9.44	300.12	9.10	38.50

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,	Date: 04/25/17		
Source:	Engine 1	Start Time: 13:05		
Run No.:	R3	Stop Time: 14:05		
Date/time	O_2.Outlet ($\%_{vd}$)	CO - outlet (ppmvd)	O_2.Inlet ($\%_{vd}$)	CO - Inlet (ppmvd)
4/25/2017 1:42:09 PM	9.24	295.20	9.20	36.00
4/25/2017 1:43:09 PM	9.45	309.85	9.30	36.60
4/25/2017 1:44:09 PM	9.33	286.11	9.30	36.30
4/25/2017 1:45:09 PM	9.34	307.15	9.10	37.00
4/25/2017 1:46:09 PM	9.76	273.01	9.60	34.10
4/25/2017 1:47:09 PM	9.91	232.15	9.60	32.10
4/25/2017 1:48:09 PM	10.90	172.05	11.00	24.70
4/25/2017 1:49:09 PM	9.18	223.54	9.20	33.30
4/25/2017 1:50:09 PM	9.82	352.25	9.40	39.60
4/25/2017 1:51:09 PM	9.41	234.68	9.40	30.50
4/25/2017 1:52:09 PM	10.34	253.13	10.30	31.70
4/25/2017 1:53:09 PM	9.97	269.91	9.60	34.70
4/25/2017 1:54:09 PM	10.17	204.61	10.10	30.30
4/25/2017 1:55:09 PM	10.03	209.30	10.00	31.00
4/25/2017 1:56:09 PM	9.68	238.75	9.50	33.00
4/25/2017 1:57:09 PM	9.43	254.97	9.40	33.10
4/25/2017 1:58:09 PM	9.43	276.03	9.30	35.00
4/25/2017 1:59:09 PM	9.39	292.26	9.30	36.20
4/25/2017 2:00:09 PM	9.45	286.28	9.30	35.50
4/25/2017 2:01:09 PM	9.83	271.48	9.60	34.90
4/25/2017 2:02:09 PM	10.27	198.96	10.20	28.90
4/25/2017 2:03:09 PM	10.91	160.20	10.70	26.70
4/25/2017 2:04:09 PM	10.07	157.99	10.10	27.00
Run Averages:	**9.65**	**264.52**	**9.51**	**34.26**

Index A4 – Facility Process Data – Engine 1

Process Data

Facility: wTE Recycling
Source: Engine 1
Date: 4/25/17

Run No.: 1
Start Time: 1032
Stop Time: 1132

Time:	Engine RPM (1-hr avg.)	Catalyst Inlet Temps. (F)		Catalyst ΔP "H_2O	Engine Hours
		Facilty (1-hr avg.)	Montrose (instantaneous)		
0 min/start	1075	767	790	0.9	-
15 min	1050	767	865	1.0	-
30 min	1020	767	860	0.9	-
45 min	1090	775	872	0.9	-
60 min/End	1175	779	857	0.9	

TC 5-G-1

Process Data

Facility: WTC Receiving
Source: Engine 1
Date: 4/25/17

Run No.: 2
Start Time: 1150
Stop Time: 1250

Time:	Engine RPM (1-hr avg.)	Catalyst Inlet Temps. (F)		Catalyst ΔP "H_2O	Engine Hours
		Facilty (1-hr avg.)	Montrose (instantaneous)		
0 min/start	1090	779	791	0.9	-
15 min	1205	813	857	1.0	-
30 min	1140	813	810	1.0	-
45 min	1115	813	856	0.9	-
60 min/End	1095	813	845	1.0	

Process Data

Facility: WTE Recycling
Source: Engine 1
Date: 4/25/17

Run No.: 3
Start Time: 1305
Stop Time: 1405

Time:	Engine RPM (1-hr avg.)	Catalyst Inlet Temps. (F)		Catalyst ΔP "H_2O	Engine Hours
		Facilty (1-hr avg.)	Montrose (instantaneous)		
0 min/start	1085	830	878	0.9	-
15 min	1080	830	875	1.0	-
30 min	1040	830	892	0.9	-
45 min	1175	830	890	0.9	-
60 min/End	1165	858	842	1.0	

Purchase History

Purchase History Register

From Comm Number: SH028 Thru Comm Number: SH028
From Receiver Date: 04/22/2017 Thru Receiver Date: 04/26/2017
Show Unposted
Account Sequence Detail Report Total UM

Account / Commodity / Receiver	Name / Description	Recv Date	Yard	Trd	Invoice	Inv Date	Period	Type / Reference	City / Contract	Net UM	State Acct Trdr / Price / UM	Amount
CONN08	MATERIALS INNOVATION AND								ROCKY HILL		CT MSM	
SH028	RDF-FERROUS RAW MATERIAL							SH6				
456313		04/24/2017	6	MSM	456313	04/24/2017	2017/04	329146	14710	37,060	50.44 / NT	
456317		04/24/2017	6	MSM	456317	04/24/2017	2017/04	329193	14710	34,340	50.44 / NT	
456364		04/24/2017	6	MSM	456364	04/24/2017	2017/04	329355	14710	36,060	50.44 / NT	
456432		04/25/2017	6	MSM	456432	04/25/2017	2017/04	329575	14710	36,200	50.44 / NT	
456437		04/25/2017	6	MSM	456437	04/25/2017	2017/04	329358	14710	36,300	50.44 / NT	
456462		04/25/2017	6	MSM	456462	04/25/2017	2017/04	329682	14710	34,640	50.44 / NT	
456468		04/25/2017	6	MSM	456468	04/25/2017	2017/04	329690	14710	37,680	50.44 / NT	
456513		04/26/2017	6	MSM	456513	04/26/2017	2017/04	329861	14710	39,060	50.44 / NT	
456517		04/26/2017	6	MSM	456517	04/26/2017	2017/04	329868	14710	37,200	50.44 / NT	
456519		04/26/2017	6	MSM	456519	04/26/2017	2017/04	329815	14710	37,780	50.44 / NT	
456541		04/26/2017	6	MSM	456541	04/26/2017	2017/04	329941	14710	37,640	50.44 / NT	
456549		04/26/2017	6	MSM	456549	04/26/2017	2017/04	329965	14710	39,260	50.44 / NT	
							Commodity Total:	Count:	12	443,120.00 LB		
							Account Total:	Count:	12	443,120.00 LB		
COVA08	COVANTA SEMASS								WEST WAREHAM		MA	
SH028	RDF-FERROUS RAW MATERIAL							SH6				
456359		04/24/2017	6	MSM	456359	04/24/2017	2017/04	1163214	14708	54,420	0.00 / GT	
456360		04/24/2017	6	MSM	456360	04/24/2017	2017/04	1163228	14708	55,460	0.00 / GT	
456438		04/25/2017	6	MSM	456438	04/25/2017	2017/04	1163434	14708	60,300	0.00 / GT	
456465		04/25/2017	6	MSM	456465	04/25/2017	2017/04	1136508	14708	57,840	0.00 / GT	
456518		04/26/2017	6	MSM	456518	04/26/2017	2017/04	1163724	14708	59,360	0.00 / GT	
456527		04/26/2017	6	MSM	456527	04/26/2017	2017/04	1163734	14708	51,840	0.00 / GT	
							Commodity Total:	Count:	6	339,220.00 LB		
							Account Total:	Count:	6	339,220.00 LB		
PENO00	PENOBSCOT ENERGY RECOVERY CO								LEWISTON		ME MSM	
SH028	RDF-FERROUS RAW MATERIAL							SH6				
456441		04/25/2017	6	MSM	456441	04/25/2017	2017/04	110250	14709	59,560	5.00 / NT	
456543		04/26/2017	6	MSM	456543	04/26/2017	2017/04	110256	14709	60,200	5.00 / NT	
							Commodity Total:	Count:	2	119,760.00 LB		
							Account Total:	Count:	2	119,760.00 LB		
							Grand Total:	Count:	20	902,100.00 LB		

403,860
287,380

TPH Calc:

Total throughput = 403,860 lb + 287,380 lb + 119,760 lb / 2,000 lb/ton = 405.5 tons / 6.85 hrs =

59.2 TPH

APPENDIX B

Emission Calculations and Field Data Sheets – Engine 2

Indices
1 - RM Emission Calculations and Field Data Sheets – Inlet
2 - RM Emission Calculations and Field Data Sheets – Outlet
3 - RM CEMS Monitoring Data – Inlet and Outlet
4 - Facility Process Data

Index B1 - RM Emission Calculations and Field Data Sheets – Engine 2, Inlet

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	7:50
Run No.:	R1-Inlet	**Stop Time:**	8:50

O_2 %vd = 9.94

CO,ppmvd (C_d) = 451.92

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 243.33 ppmvd@15%O_2

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	9:05
Run No.:	R2-Inlet	**Stop Time:**	10:05

O_2,%vd =	10.27
CO,ppmvd (C_d) =	393.89

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 218.59 ppmvd@15%O_2

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	10:23
Run No.:	R3-Inlet	**Stop Time:**	11:23

O_2,%vd =	10.47
CO,ppmvd (C_d) =	326.07

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 184.42 ppmvd@15%O_2

Analyzer Calibration Error Checks (ACE)

Facility / Site:	wTe Recycling Greenfield, MA	Date:	26-Apr-17
Source:	Engine 2		

Diluent/Pollutant	O_2		CO		
Monitor Range (Programmed)	25		200		
Monitor Range (Effective, per Method)	20.98		945		
--- Low Level Analyzer Calibration Error ---					
Cylinder Value	0.00		0.00		
Response	0.00		0.00		
ACE	0.00		0.00		
Calibration Status (Pass/Fail)	Pass		Pass		
--- Mid Level Analyzer Calibration Error ---					
Cylinder Value (Mid)	10.99		448.00		
Analyzer Response (Mid)	11.15		439.00		
ACE	0.76		-0.95		
Calibration Status (Pass/Fail)	Pass		Pass		
--- High Level Analyzer Calibration Error ---					
Cylinder Value (High/Span)	20.98		945.00		
Analyzer Response (High)	21.00		945.00		
ACE	0.10		0.00		
Calibration Status (Pass/Fail)	Pass		Pass		
--- Mid Level Gas Range Assessment ---					
Cylinder Value (Mid)	10.99		448.00		
Cylinder Value (High/Span)	20.98		945.00		
Mid Level Gas (Percentage of Span)	52.4%		47.4%		
Calibration Gas Status (Pass/Fail)	Pass		Pass		
--- System Calibration Gas Selection ---					
Use Mid or High Span (M or H)	M		M		

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	7:50
Run No.:	R1-Inlet	**Stop Time:**	8:50

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	945
Analyzer Zero Response =	0.00	0.0
Analyzer Span Response =	11.15	439.0
Initial Sytem Zero Response =	0.15	0.5
Final System Zero Response =	0.15	0.6
Average Zero Response (C_o) =	0.15	0.6
Initial Sytem Span Response =	11.10	434.0
Final System Span Response =	11.15	434.0
Average Span Response (C_m) =	11.13	434.0
Calibration gas values (C_{ma}) =	10.99	448.0
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.71	0.05
Final Zero Bias (SB_{final}) =	0.71	0.06
Zero Drift (D) =	0.00	0.01
Initial Span Bias (SB_i) =	-0.24	-0.53
Final Span Bias (SB_{final}) =	0.00	-0.53
Span Drift (D) =	0.24	0.00
Uncorrected Ave. (C_{Avg}) =	10.08	437.79
Corrected Ave.=C_{gas} = (C_{Avg}-C_o)(C_{ma}/(C_m-C_o)) =	9.94	451.92

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	9:05
Run No.:	R2-Inlet	**Stop Time:**	10:05

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	945
Analyzer Zero Response =	0.00	0.0
Analyzer Span Response =	11.15	439.0
Initial Sytem Zero Response =	0.15	0.6
Final System Zero Response =	0.15	0.6
Average Zero Response (C_o) =	0.15	0.6
Initial Sytem Span Response =	11.15	434.0
Final System Span Response =	11.10	433.0
Average Span Response (C_m) =	11.13	433.5
Calibration gas values (C_{ma}) =	10.99	448.0
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.71	0.06
Final Zero Bias (SB_{final}) =	0.71	0.06
Zero Drift (D) =	0.00	0.00
Initial Span Bias (SB_i) =	0.00	-0.53
Final Span Bias (SB_{final}) =	-0.24	-0.63
Span Drift (D) =	0.24	0.11
Uncorrected Ave. ($\overline{C_{Avg}}$) =	10.40	381.21
Corrected Ave.=C_{gas} = (C_{Avg}-C_o)(C_{ma}/(C_m-C_o)) =	10.27	393.89

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	10:23
Run No.:	R3-Inlet	**Stop Time:**	11:23

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	945
Analyzer Zero Response =	0.00	0.0
Analyzer Span Response =	11.15	439.0
Initial Sytem Zero Response =	0.15	0.6
Final System Zero Response =	0.20	0.5
Average Zero Response (C_o) =	0.18	0.6
Initial Sytem Span Response =	11.10	433.0
Final System Span Response =	11.10	434.0
Average Span Response (C_m) =	11.10	433.5
Calibration gas values (C_{ma}) =	10.99	448.0
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.71	0.06
Final Zero Bias (SB_{final}) =	0.95	0.05
Zero Drift (D) =	0.24	0.01
Initial Span Bias (SB_i) =	-0.24	-0.63
Final Span Bias (SB_{final}) =	-0.24	-0.53
Span Drift (D) =	0.00	0.11
Uncorrected Ave. ($\overline{C_{Avg}}$) =	10.58	315.67
Corrected Ave.=C_{gas} = ($\overline{C_{Avg}}$-C_o)(C_{ma}/(C_m-C_o)) =	10.47	326.07

MONTROSE
AIR QUALITY SERVICES

Client/Site: wte Recycling Greenfield, MA
Source: Engine 2 - Inlet
RM Response Time: Upscale (seconds): 30

Operator: JCarr
Date: 4/26/17
Downscale (seconds): 30

Note: System Response Time is the longer of the upscale and downscale response times. Performed during initial zero and bias checks.

Analyzer Calibration Error (ACE) – Reference Method (beg of day)

Pollutant/Diluent	Analyzer ID	Low		Mid		High/Full Scale (CS)	
		Cylinder Value (C_v)	Analyzer Response (C_{DIR})	Cylinder Value (C_v)	Analyzer Response (C_{DIR})	Cylinder Value (C_v)	Analyzer Response (C_{DIR})
O_2	CAI 600 #2	0.00	0.10	10.99	11.15	20.95	21.00
CO	TECO 48C	0.0	0.0	448	439	945	945

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		1,000		

Protocol Gases Used During Program:

Cylinder No.	Diluent/Pollutant Concentrations(s)	Expiration Date
Same as prior day except		
EB0084752	10.99% O_2	

Analyzer Calibration Error (ACE) Acceptance Criteria: ≤ ± 2%

Where: ACE = $[(C_{Dir} - C_v)/CS] * 100\%$

MONTROSE
AIR QUALITY SERVICES

Client/Site: wTe Recycling Greenfield, MA
Source: Engine 2 0 - Inlet

Operator: D Caron
Date: 4/26/17

Run Number: Eng 2 - Run 1
Start Time: 750
End Time: 850

R1 O_2 - 10.08
CO - 437.79

System Bias (SB)/Drift (D) Assessments – Reference Method

Run 1 (I) Run 1 (F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.15	10.99	11.10	0.00	0.15	10.99	11.15
CO	0.0	0.5	448	434	0.00	0.6	448	434

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		1,000		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: $SB = [(C_S - C_{DV})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

MONTROSE
AIR QUALITY SERVICES

Client/Site: wTe Recycling Greenfield, MA
Source: Engine 2 - Inlet
Operator: D Cuson
Date: 4/26/17

Run Number: Eng 2 - Run 2
Start Time: 905
End Time: 1005

R2 O2 - 10.40
CO - 381.21

System Bias (SB)/Drift (D) Assessments – Reference Method

R2 (I) R2 (F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.15	10.59	11.15	0.00	0.15	10.59	11.10
CO	0.00	0.6	448	434	0.0	0.6	448	433

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25%		1,000		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: $SB = [(C_s - C_{Da})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB_i|$

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling Greenfield, MA
Source: Engine 2 - ~~Exhaust~~ Inlet

Operator: D Cara
Date: 4/26/17

Run Number: Eng 2 - Run 3
Start Time: 1023
End Time: 1123

Run 3 O_2 - 10.58
CO - 315.67

System Bias (SB)/Drift (D) Assessments – Reference Method

R3 (I) R3 (f)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.15	10.59	11.10	0.00	0.20	10.99	~~11.23~~ 11.10
CO	0.0	0.6	448	433	0.00	0.5	448	434

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: $SB = |(C_S - C_{DA})/CS| * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

Index B2 - RM Emission Calculations and Field Data Sheets – Engine 2, Outlet

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	7:50
Run No.:	R1-Outlet	**Stop Time:**	8:50

O_2,%vd =	9.86
CO,ppmvd (C_d) =	38.80

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 20.74 ppmvd@15%O_2

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	9:05
Run No.:	R2-Outlet	**Stop Time:**	10:05

O_2,%vd =	10.15
CO,ppmvd (C_d) =	35.32

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 19.39 ppmvd@15%O_2

Emission Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	10:23
Run No.:	R3-Outlet	**Stop Time:**	11:23

O_2,%vd =	10.38
CO,ppmvd (C_d) =	32.68

Carbon Monoxide

$E = C_d (5.9/(20.9-\%O_2))$ = 18.32 ppmvd@15%O_2

Analyzer Calibration Error Checks (ACE)

Facility / Site:	wTe Recycling Greenfield, MA	Date:	26-Apr-17
Source:	Engine 2		

Diluent/Pollutant	O_2		CO		
Monitor Range (Programmed)	25		100		
Monitor Range (Effective, per Method)	20.98		92.0		
--- Low Level Analyzer Calibration Error ---					
Cylinder Value	0.00		0.00		
Response	0.10		0.00		
ACE	0.48		0.00		
Calibration Status (Pass/Fail)	Pass		Pass		
--- Mid Level Analyzer Calibration Error ---					
Cylinder Value (Mid)	10.99		45.30		
Analyzer Response (Mid)	11.20		44.90		
ACE	1.00		-0.43		
Calibration Status (Pass/Fail)	Pass		Pass		
--- High Level Analyzer Calibration Error ---					
Cylinder Value (High/Span)	20.98		92.00		
Analyzer Response (High)	21.00		91.90		
ACE	0.10		-0.11		
Calibration Status (Pass/Fail)	Pass		Pass		
--- Mid Level Gas Range Assessment ---					
Cylinder Value (Mid)	10.99		45.30		
Cylinder Value (High/Span)	20.98		92.00		
Mid Level Gas (Percentage of Span)	52.4%		49.2%		
Calibration Gas Status (Pass/Fail)	Pass		Pass		
--- System Calibration Gas Selection ---					
Use Mid or High Span (M or H)	M		M		

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	7:50
Run No.:	R1-Outlet	**Stop Time:**	8:50

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	92
Analyzer Zero Response =	0.10	0.0
Analyzer Span Response =	11.20	44.9
Initial Sytem Zero Response =	0.20	0.1
Final System Zero Response =	0.20	-0.2
Average Zero Response (C_o) =	0.20	-0.1
Initial Sytem Span Response =	11.20	44.8
Final System Span Response =	11.05	44.4
Average Span Response (C_m) =	11.13	44.6
Calibration gas values (C_{ma}) =	10.99	45.3
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.48	0.11
Final Zero Bias (SB_{final}) =	0.48	-0.22
Zero Drift (D) =	0.00	0.33
Initial Span Bias (SB_i) =	0.00	-0.11
Final Span Bias (SB_{final}) =	-0.71	-0.54
Span Drift (D) =	0.71	0.43
Uncorrected Ave. (C_{Avg}) =	10.01	38.20
Corrected Ave.=C_{gas} = (C_{Avg}-C_o)(C_{ma}/(C_m-C_o)) =	9.86	38.80

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	9:05
Run No.:	R2-Outlet	**Stop Time:**	10:05

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	92
Analyzer Zero Response =	0.10	0.0
Analyzer Span Response =	11.20	44.9
Initial Sytem Zero Response =	0.20	-0.2
Final System Zero Response =	0.20	-0.2
Average Zero Response (C_o) =	0.20	-0.2
Initial Sytem Span Response =	11.05	44.4
Final System Span Response =	11.05	44.9
Average Span Response (C_m) =	11.05	44.7
Calibration gas values (C_{ma}) =	10.99	45.3
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.48	-0.22
Final Zero Bias (SB_{final}) =	0.48	-0.22
Zero Drift (D) =	0.00	0.00
Initial Span Bias (SB_i) =	-0.71	-0.54
Final Span Bias (SB_{final}) =	-0.71	0.00
Span Drift (D) =	0.00	0.54
Uncorrected Ave. ($\overline{C_{Avg}}$) =	10.22	34.77
Corrected Ave.=C_{gas} = (C_{Avg}-C_o)(C_{ma}/(C_m-C_o)) =	10.15	35.32

CEMS Pre/Post-Test Bias/Drift Calibration Checks and Calculations

Facility/Site:	wTe Recycling Greenfield, MA	**Date:**	04/26/17
Source:	Engine 2	**Start Time:**	10:23
Run No.:	R3-Outlet	**Stop Time:**	11:23

Diluent/Pollutant:	O_2 (%$_{vd}$)	CO (ppmvd)
Instrument Span =	20.98	92
Analyzer Zero Response =	0.10	0.0
Analyzer Span Response =	11.20	44.9
Initial Sytem Zero Response =	0.20	-0.2
Final System Zero Response =	0.20	-0.3
Average Zero Response (C_o) =	0.20	-0.3
Initial Sytem Span Response =	11.05	44.9
Final System Span Response =	11.05	44.6
Average Span Response (C_m) =	11.05	44.8
Calibration gas values (C_{ma}) =	10.99	45.3
System Bias (SB) and Drift Calculations:		
Initial Zero Bias (SB_i) =	0.48	-0.22
Final Zero Bias (SB_{final}) =	0.48	-0.33
Zero Drift (D) =	0.00	0.11
Initial Span Bias (SB_i) =	-0.71	0.00
Final Span Bias (SB_{final}) =	-0.71	-0.33
Span Drift (D) =	0.00	0.33
Uncorrected Ave. ($\overline{C_{Avg}}$) =	10.44	32.22
Corrected Ave.=C_{gas} = ($\overline{C_{Avg}}$-C_o)(C_{ma}/(C_m-C_o)) =	10.38	32.68

MONTROSE AIR QUALITY SERVICES

Client/Site: WTE Recycling Greenfield, MA

Source: Engine #2 - Outlet

Operator: D Caron

Date: 4/26/17

RM Response Time:

Upscale (seconds): 20

Downscale (seconds): 30

Note: System Response Time is the longer of the upscale and downscale response times. Performed during initial zero and bias checks.

Analyzer Calibration Error (ACE) – Reference Method (6 eg of day)

Pollutant/Diluent	Analyzer ID	Low		Mid		High/Full Scale (CS)	
		Cylinder Value (C_v)	Analyzer Response (C_{DIR})	Cylinder Value (C_v)	Analyzer Response (C_{DIR})	Cylinder Value (C_v)	Analyzer Response (C_{DIR})
O_2	Teledyne O_2 #2	0.00	0.10	10.99	11.20	20.95	21.00
CO	TECO 48i	0.0	0.0	45.3	44.9	92.0	91.9

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100		

Protocol Gases Used During Program:

Cylinder No.	Diluent/Pollutant Concentrations(s)	Expiration Date
same as prior day except		
EB0084752	10.99% O_2	

Analyzer Calibration Error (ACE) Acceptance Criteria: ≤ ± 2%

Where: ACE = $[(C_{Dir} - C_v)/CS] * 100\%$

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling
Source: Engine 2 Exhaust

Operator: JD Caron
Date: 4/24/17

Run Number: Eng 2 - Run 1
Start Time: 750
End Time: 850

RUN 1 O2 - 10.01
CO - 38.20

STRAT more to it 1@750
2@810
3@830

System Bias (SB)/Drift (D) Assessments – Reference Method

RUN 1 / STRAT (I) RUN 1 / STRAT (F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.20	10.99	11.20	0.00	0.20	10.99	11.05
CO	0.00	0.1	45.3	44.8	0.00	-0.2	45.3	44.4

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: SB = $[(C_s - C_{Da})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling
Source: Engine 2 - Outlet

Operator: D Carey
Date: 4/20/17

Run Number: Eng 2 - R2
Start Time: 905
End Time: 1005

O_2 - 10.22
CO - 34.78

System Bias (SB)/Drift (D) Assessments – Reference Method

R2(I) R2(F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.20	10.99	11.05	0.00	0.20	10.99	11.05
CO	0.0	0.2	45.3	44.4	0.0	0.2	45.3	44.9

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: $SB = [(C_S - C_{DV})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling Greenfield, MA
Source: Engine 2 - Outlet
Operator: DCarew
Date: 4/26/17

Run Number: Eng 2 - Run 3
Start Time: 1023
End Time: 1123

Run 3 O_2 - 10.44
CO - 32.22

System Bias (SB)/Drift (D) Assessments – Reference Method

R3(I) R3(F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O2	0.00	0.20	10.99	11.05	0.00	0.20	10.99	11.05
CO	0.00	0.2	45.3	44.9	00	-0.3	45.3	44.6

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: SB = $[(C_s - C_{Da})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

Index B3 - RM CEMS Monitoring Data – Engine 2, Inlet and Outlet

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,	Date: 04/26/17			
Source:	Engine 2	Start Time: 7:50			
Run No.:	Run 1	Stop Time: 8:50			
Date/time	O_2.Inlet ($\%_{vd}$)	CO - Inlet (ppmvd)	O_2.Outlet ($\%_{vd}$)	CO - outlet (ppmvd)	
4/26/2017 7:50:38 AM	10.21	503.84	10.00	50.70	
4/26/2017 7:51:38 AM	10.81	331.05	10.80	34.50	
4/26/2017 7:52:38 AM	10.05	321.08	10.20	35.90	
4/26/2017 7:53:38 AM	9.78	490.02	9.70	45.00	
4/26/2017 7:54:38 AM	9.97	473.40	9.90	42.10	
4/26/2017 7:55:38 AM	9.96	453.32	10.00	41.30	
4/26/2017 7:56:38 AM	9.65	489.27	9.60	43.40	
4/26/2017 7:57:38 AM	9.98	507.68	9.90	43.10	
4/26/2017 7:58:38 AM	9.78	467.88	9.70	41.20	
4/26/2017 7:59:38 AM	12.24	360.23	12.00	30.40	
4/26/2017 8:00:38 AM	9.66	321.36	9.70	31.30	
4/26/2017 8:01:38 AM	10.30	451.36	10.30	38.30	
4/26/2017 8:02:38 AM	10.48	377.63	10.40	36.70	
4/26/2017 8:03:38 AM	9.78	391.91	9.80	37.40	
4/26/2017 8:04:38 AM	10.30	452.27	10.10	39.60	
4/26/2017 8:05:38 AM	9.97	386.43	10.00	36.30	
4/26/2017 8:06:38 AM	10.04	470.47	9.90	41.10	
4/26/2017 8:07:38 AM	10.03	415.97	10.00	36.80	
4/26/2017 8:08:38 AM	10.36	413.74	10.40	37.30	
4/26/2017 8:09:38 AM	9.57	504.68	9.50	39.50	
4/26/2017 8:10:38 AM	10.11	464.15	10.00	37.70	
4/26/2017 8:11:38 AM	10.02	416.33	10.00	36.90	
4/26/2017 8:12:38 AM	10.03	458.38	9.90	40.00	
4/26/2017 8:13:38 AM	9.76	439.92	9.80	37.80	
4/26/2017 8:14:38 AM	9.41	552.06	9.40	43.80	
4/26/2017 8:15:38 AM	10.04	543.86	9.90	41.70	
4/26/2017 8:16:38 AM	9.83	412.82	9.90	35.20	
4/26/2017 8:17:38 AM	9.93	510.00	9.80	40.60	
4/26/2017 8:18:38 AM	10.01	472.34	9.90	40.20	
4/26/2017 8:19:38 AM	10.05	435.54	10.00	38.10	
4/26/2017 8:20:38 AM	10.19	414.62	10.10	37.20	
4/26/2017 8:21:38 AM	9.89	424.57	9.90	37.90	
4/26/2017 8:22:38 AM	10.14	450.05	10.00	38.60	
4/26/2017 8:23:38 AM	9.96	395.79	10.10	35.80	
4/26/2017 8:24:38 AM	9.91	476.82	9.80	39.70	
4/26/2017 8:25:38 AM	10.07	476.96	9.90	39.00	
4/26/2017 8:26:38 AM	9.25	532.66	9.30	42.10	

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,		**Date:** 04/26/17		
Source:	Engine 2		**Start Time:** 7:50		
Run No.:	Run 1		**Stop Time:** 8:50		
Date/time	**O_2.Inlet ($\%_{vd}$)**	**CO - Inlet (ppmvd)**	**O_2.Outlet ($\%_{vd}$)**	**CO - outlet (ppmvd)**	
4/26/2017 8:27:38 AM	9.89	597.85	9.70	44.10	
4/26/2017 8:28:38 AM	9.93	467.39	9.80	38.50	
4/26/2017 8:29:38 AM	9.78	482.19	9.80	39.80	
4/26/2017 8:30:38 AM	9.97	461.36	10.00	38.40	
4/26/2017 8:31:38 AM	9.91	465.23	9.80	39.30	
4/26/2017 8:32:38 AM	9.94	460.36	9.90	39.20	
4/26/2017 8:33:38 AM	9.72	497.00	9.60	39.90	
4/26/2017 8:34:38 AM	10.07	470.04	10.00	39.20	
4/26/2017 8:35:38 AM	10.39	406.73	10.20	35.80	
4/26/2017 8:36:38 AM	10.47	373.92	10.20	34.70	
4/26/2017 8:37:38 AM	10.92	289.17	11.00	27.00	
4/26/2017 8:38:38 AM	9.89	357.80	9.80	34.10	
4/26/2017 8:39:38 AM	10.18	475.13	10.00	40.70	
4/26/2017 8:40:38 AM	9.83	445.37	9.70	36.40	
4/26/2017 8:41:38 AM	10.02	466.45	9.90	39.20	
4/26/2017 8:42:38 AM	10.55	403.02	10.30	35.70	
4/26/2017 8:43:38 AM	10.97	285.12	10.80	28.60	
4/26/2017 8:44:38 AM	10.14	308.15	10.10	31.40	
4/26/2017 8:45:38 AM	10.05	393.90	10.10	35.50	
4/26/2017 8:46:38 AM	10.29	459.76	9.90	39.90	
4/26/2017 8:47:38 AM	10.43	333.10	10.50	31.30	
4/26/2017 8:48:38 AM	9.79	419.55	9.70	38.80	
4/26/2017 8:49:38 AM	10.09	488.41	9.90	40.00	
Run Averages:	**10.08**	**437.79**	**10.01**	**38.20**	

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,	Date: 04/26/17		
Source:	Engine 2	Start Time: 9:05		
Run No.:	R2	Stop Time: 10:05		
Date/time	O_2.Outlet ($\%_{vd}$)	CO - outlet (ppmvd)	O_2.Inlet ($\%_{vd}$)	CO - Inlet (ppmvd)
4/26/2017 9:05:38 AM	10.18	455.67	10.10	44.90
4/26/2017 9:06:38 AM	10.60	391.52	10.40	40.60
4/26/2017 9:07:38 AM	10.63	309.76	10.40	34.00
4/26/2017 9:08:38 AM	10.51	306.33	10.30	34.00
4/26/2017 9:09:38 AM	10.42	318.14	10.30	34.30
4/26/2017 9:10:38 AM	10.10	380.63	9.90	38.20
4/26/2017 9:11:38 AM	10.37	370.02	10.20	36.10
4/26/2017 9:12:38 AM	10.52	330.06	10.30	33.50
4/26/2017 9:13:38 AM	10.20	314.03	10.20	31.70
4/26/2017 9:14:38 AM	11.34	396.26	10.80	35.10
4/26/2017 9:15:38 AM	10.44	227.70	10.50	24.50
4/26/2017 9:16:38 AM	9.54	424.05	9.40	39.50
4/26/2017 9:17:38 AM	9.78	519.88	9.70	43.10
4/26/2017 9:18:38 AM	10.50	433.01	10.20	37.50
4/26/2017 9:19:38 AM	10.16	353.41	10.00	34.30
4/26/2017 9:20:38 AM	10.49	359.25	10.30	34.30
4/26/2017 9:21:38 AM	10.78	312.62	10.60	32.00
4/26/2017 9:22:38 AM	10.41	296.86	10.30	31.00
4/26/2017 9:23:38 AM	10.19	364.08	10.00	35.70
4/26/2017 9:24:38 AM	9.94	423.59	9.80	38.70
4/26/2017 9:25:38 AM	10.22	415.42	10.00	37.10
4/26/2017 9:26:38 AM	9.70	410.00	9.70	37.60
4/26/2017 9:27:38 AM	10.74	444.41	10.30	37.10
4/26/2017 9:28:38 AM	11.00	289.87	10.90	27.40
4/26/2017 9:29:38 AM	10.17	353.14	10.10	35.60
4/26/2017 9:30:38 AM	10.31	403.98	9.90	36.80
4/26/2017 9:31:38 AM	10.13	377.08	10.10	33.30
4/26/2017 9:32:38 AM	10.04	437.42	9.90	39.00
4/26/2017 9:33:38 AM	9.92	413.14	9.80	37.10
4/26/2017 9:34:38 AM	9.49	488.76	9.50	41.50
4/26/2017 9:35:38 AM	10.36	506.78	9.90	40.10
4/26/2017 9:36:38 AM	10.15	353.76	10.10	32.90
4/26/2017 9:37:38 AM	10.29	386.87	10.10	36.10
4/26/2017 9:38:38 AM	10.74	356.29	10.40	34.00
4/26/2017 9:39:38 AM	10.98	253.67	10.80	26.50
4/26/2017 9:40:38 AM	10.07	287.94	10.10	30.40
4/26/2017 9:41:38 AM	9.94	453.48	9.70	39.30

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,	Date: 04/26/17		
Source:	Engine 2	Start Time: 9:05		
Run No.:	R2	Stop Time: 10:05		
Date/time	O_2.Outlet ($\%_{vd}$)	CO - outlet (ppmvd)	O_2.Inlet ($\%_{vd}$)	CO - Inlet (ppmvd)
4/26/2017 9:42:38 AM	10.01	476.90	9.60	40.40
4/26/2017 9:43:38 AM	10.57	359.71	10.50	30.50
4/26/2017 9:44:38 AM	10.40	334.14	10.30	33.40
4/26/2017 9:45:38 AM	10.21	358.43	10.10	34.50
4/26/2017 9:46:38 AM	10.25	405.08	9.90	36.40
4/26/2017 9:47:38 AM	13.33	291.10	12.50	27.00
4/26/2017 9:48:38 AM	13.39	94.66	13.70	7.80
4/26/2017 9:49:38 AM	9.79	277.32	9.80	30.90
4/26/2017 9:50:38 AM	10.07	486.50	9.80	43.20
4/26/2017 9:51:38 AM	10.22	458.05	10.00	40.10
4/26/2017 9:52:38 AM	10.59	392.36	10.30	33.50
4/26/2017 9:53:38 AM	10.33	282.57	10.40	26.60
4/26/2017 9:54:38 AM	9.68	449.76	9.60	40.90
4/26/2017 9:55:38 AM	9.52	565.72	9.40	44.70
4/26/2017 9:56:38 AM	9.83	571.75	9.60	43.30
4/26/2017 9:57:38 AM	10.82	440.72	10.40	36.10
4/26/2017 9:58:38 AM	9.79	342.99	9.90	30.20
4/26/2017 9:59:38 AM	9.95	512.34	9.70	41.40
4/26/2017 10:00:38 AM	10.47	434.42	10.40	35.60
4/26/2017 10:01:38 AM	10.33	519.80	9.80	36.40
4/26/2017 10:02:38 AM	11.86	344.22	11.80	19.80
4/26/2017 10:03:38 AM	11.00	182.22	11.00	21.80
4/26/2017 10:04:38 AM	10.51	373.22	9.90	36.90
Run Averages:	**10.40**	**381.21**	**10.22**	**34.77**

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,		Date: 04/26/17	
Source:	Engine 2		Start Time: 10:23	
Run No.:	R3		Stop Time: 11:23	
Date/time	O_2.Outlet ($\%_{vd}$)	CO - outlet (ppmvd)	O_2.Inlet ($\%_{vd}$)	CO - Inlet (ppmvd)
4/26/2017 10:23:38 AM	12.64	128.28	13.30	13.10
4/26/2017 10:24:38 AM	10.44	207.97	10.60	27.40
4/26/2017 10:25:38 AM	11.37	418.18	10.90	49.10
4/26/2017 10:26:38 AM	10.73	267.03	10.60	29.50
4/26/2017 10:27:38 AM	10.79	360.81	10.50	37.70
4/26/2017 10:28:38 AM	10.49	297.72	10.60	29.90
4/26/2017 10:29:38 AM	10.64	326.64	10.40	35.80
4/26/2017 10:30:38 AM	10.75	287.71	10.60	32.40
4/26/2017 10:31:38 AM	10.76	276.18	10.60	31.50
4/26/2017 10:32:38 AM	10.70	259.08	10.60	29.40
4/26/2017 10:33:38 AM	10.93	281.70	10.70	31.60
4/26/2017 10:34:38 AM	10.40	289.62	10.20	31.30
4/26/2017 10:35:38 AM	10.07	346.63	10.10	34.20
4/26/2017 10:36:38 AM	10.36	397.83	10.20	37.70
4/26/2017 10:37:38 AM	10.22	353.93	10.10	35.20
4/26/2017 10:38:38 AM	10.17	387.65	10.00	37.30
4/26/2017 10:39:38 AM	10.27	377.03	10.20	36.50
4/26/2017 10:40:38 AM	10.19	380.96	9.90	36.40
4/26/2017 10:41:38 AM	10.24	365.66	10.20	34.80
4/26/2017 10:42:38 AM	10.30	387.11	10.10	36.60
4/26/2017 10:43:38 AM	10.20	380.42	10.10	36.30
4/26/2017 10:44:38 AM	10.39	380.06	10.10	36.30
4/26/2017 10:45:38 AM	10.34	332.61	10.20	32.70
4/26/2017 10:46:38 AM	10.27	353.97	10.10	35.10
4/26/2017 10:47:38 AM	10.46	352.98	10.30	34.80
4/26/2017 10:48:38 AM	10.16	353.19	10.00	35.10
4/26/2017 10:49:38 AM	10.26	385.38	10.00	36.50
4/26/2017 10:50:38 AM	10.45	356.98	10.30	34.60
4/26/2017 10:51:38 AM	10.11	356.30	10.00	34.70
4/26/2017 10:52:38 AM	10.65	348.14	10.40	33.00
4/26/2017 10:53:38 AM	10.38	324.05	10.30	33.20
4/26/2017 10:54:38 AM	10.16	340.65	10.10	33.30
4/26/2017 10:55:38 AM	10.67	365.65	10.40	35.10
4/26/2017 10:56:38 AM	10.42	310.42	10.20	31.40
4/26/2017 10:57:38 AM	10.30	329.56	10.20	32.50
4/26/2017 10:58:38 AM	10.53	330.73	10.40	32.70
4/26/2017 10:59:38 AM	10.87	299.41	10.70	31.20

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,		Date: 04/26/17		
Source:	Engine 2		Start Time: 10:23		
Run No.:	R3		Stop Time: 11:23		
Date/time	O_2 Outlet ($\%_{vd}$)	CO - outlet (ppmvd)	O_2 Inlet ($\%_{vd}$)	CO - Inlet (ppmvd)	
4/26/2017 11:00:38 AM	10.58	252.41	10.50	27.80	
4/26/2017 11:01:38 AM	10.43	312.93	10.30	32.60	
4/26/2017 11:02:38 AM	10.46	331.50	10.30	33.50	
4/26/2017 11:03:38 AM	10.68	312.64	10.60	32.10	
4/26/2017 11:04:38 AM	10.48	303.76	10.30	31.30	
4/26/2017 11:05:38 AM	10.59	304.49	10.50	31.40	
4/26/2017 11:06:38 AM	10.98	279.69	10.70	29.50	
4/26/2017 11:07:38 AM	11.22	210.50	11.10	23.50	
4/26/2017 11:08:38 AM	10.87	228.41	10.70	26.40	
4/26/2017 11:09:38 AM	10.52	273.62	10.50	30.20	
4/26/2017 11:10:38 AM	10.96	293.79	10.70	30.50	
4/26/2017 11:11:38 AM	11.15	225.75	10.90	25.40	
4/26/2017 11:12:38 AM	11.38	196.65	11.20	22.90	
4/26/2017 11:13:38 AM	11.26	188.21	11.10	22.90	
4/26/2017 11:14:38 AM	11.23	192.14	11.10	22.80	
4/26/2017 11:15:38 AM	10.40	221.35	10.50	24.60	
4/26/2017 11:16:38 AM	9.78	444.96	9.60	40.60	
4/26/2017 11:17:38 AM	10.08	436.71	9.90	37.60	
4/26/2017 11:18:38 AM	10.57	388.73	10.30	36.10	
4/26/2017 11:19:38 AM	10.48	297.90	10.40	29.80	
4/26/2017 11:20:38 AM	10.88	286.76	10.70	29.50	
4/26/2017 11:21:38 AM	10.26	282.89	10.20	30.00	
4/26/2017 11:22:38 AM	10.56	376.00	10.30	36.00	
Run Averages:	**10.58**	**315.67**	**10.44**	**32.22**	

Index B4 – Facility Process Data - Engine 2

Process Data

Facility: WTE Recycling Greenfield, MA
Source: Engine #2
Date: 4/26/17

Run No.: 1
Start Time: 750
Stop Time: 850

Time:	Engine RPM (1-hr avg.)	Catalyst Inlet Temps. (F)		Catalyst ΔP "H_2O	Engine Hours
		Facilty (1-hr avg.)	Montrose (instantaneous)		
0 min/start	1160	851	795	1.4	-
15 min	1105	851	887	1.5	-
30 min	1086	826	887	1.5	-
45 min	1165	826	855	1.4	-
60 min/End	1110	826	882	1.5	

TC IO-5-6-1

Process Data

Facility:	WTE Recycling	Run No.:	2
Source:	Engine 2	Start Time:	905
Date:	4/26/17	Stop Time:	1005

Time:	Engine RPM (1-hr avg.)	Catalyst Inlet Temps. (F)		Catalyst ΔP "H_2O	Engine Hours
		Facilty (1-hr avg.)	Montrose (instantaneous)		
0 min/start	1140	826	781	1.8	-
15 min	1140	813	877	1.4	-
30 min	1140	813	880	1.7	-
45 min	1200	813	790	1.6	-
60 min/End	1260	813	802	1.5	

Process Data

Facility: WTE Recycling Greenfield, MA
Source: Engine 2
Date: 4/26/17

Run No.: 3
Start Time: 1023
Stop Time: 1123

Time:	Engine RPM (1-hr avg.)	Catalyst Inlet Temps. (F)		Catalyst ΔP "H_2O	Engine Hours
		Facilty (1-hr avg.)	Montrose (instantaneous)		
0 min/start	1130	819	766	1.4	-
15 min	1110	819	870	1.4	-
30 min	1130	819	854	1.6	-
45 min	1205	819	834	1.7	-
60 min/End	1120	834	837	1.6	

Purchase History

Purchase History Register

From Comm Number: SH028 Thru Comm Number: SH028
From Receiver Date: 04/22/2017 Thru Receiver Date: 04/26/2017
Show Unposted
Account Sequence Detail Report Total UM

Account / Commodity / Receiver	Name / Description	Recv Date	Yard	Trd	Invoice	Inv Date	Period	Type / Reference	City / Contract	Net UM	State Acct Trdr / Price / UM	Amount
CONN08	MATERIALS INNOVATION AND								ROCKY HILL		CT MSM	
SH028	RDF-FERROUS RAW MATERIAL							SH6				
456313		04/24/2017	6	MSM	456313	04/24/2017	2017/04	329146	14710	37,060	50.44 / NT	
456317		04/24/2017	6	MSM	456317	04/24/2017	2017/04	329193	14710	34,340	50.44 / NT	
456364		04/24/2017	6	MSM	456364	04/24/2017	2017/04	329355	14710	36,060	50.44 / NT	
456432		04/25/2017	6	MSM	456432	04/25/2017	2017/04	329575	14710	36,200	50.44 / NT	
456437		04/25/2017	6	MSM	456437	04/25/2017	2017/04	329358	14710	36,300	50.44 / NT	
456462		04/25/2017	6	MSM	456462	04/25/2017	2017/04	329682	14710	34,640	50.44 / NT	
456468		04/25/2017	6	MSM	456468	04/25/2017	2017/04	329690	14710	37,680	50.44 / NT	
456513		04/26/2017	6	MSM	456513	04/26/2017	2017/04	329861	14710	39,060	50.44 / NT	
456517		04/26/2017	6	MSM	456517	04/26/2017	2017/04	329868	14710	37,200	50.44 / NT	
456519		04/26/2017	6	MSM	456519	04/26/2017	2017/04	329815	14710	37,780	50.44 / NT	
456541		04/26/2017	6	MSM	456541	04/26/2017	2017/04	329941	14710	37,640	50.44 / NT	
456549		04/26/2017	6	MSM	456549	04/26/2017	2017/04	329965	14710	39,260	50.44 / NT	
							Commodity Total:	Count:	12	443,120.00 LB		
							Account Total:	Count:	12	443,120.00 LB		
COVA08	COVANTA SEMASS								WEST WAREHAM		MA	
SH028	RDF-FERROUS RAW MATERIAL							SH6				
456359		04/24/2017	6	MSM	456359	04/24/2017	2017/04	1163214	14708	54,420	0.00 / GT	
456360		04/24/2017	6	MSM	456360	04/24/2017	2017/04	1163228	14708	55,460	0.00 / GT	
456438		04/25/2017	6	MSM	456438	04/25/2017	2017/04	1163434	14708	60,300	0.00 / GT	
456465		04/25/2017	6	MSM	456465	04/25/2017	2017/04	1136508	14708	57,840	0.00 / GT	
456518		04/26/2017	6	MSM	456518	04/26/2017	2017/04	1163724	14708	59,360	0.00 / GT	
456527		04/26/2017	6	MSM	456527	04/26/2017	2017/04	1163734	14708	51,640	0.00 / GT	
							Commodity Total:	Count:	6	339,220.00 LB		
							Account Total:	Count:	6	339,220.00 LB		
PENO00	PENOBSCOT ENERGY RECOVERY CO								LEWISTON		ME MSM	
SH028	RDF-FERROUS RAW MATERIAL							SH6				
456441		04/25/2017	6	MSM	456441	04/25/2017	2017/04	110250	14709	59,560	5.00 / NT	
456543		04/26/2017	6	MSM	456543	04/26/2017	2017/04	110256	14709	60,200	5.00 / NT	
							Commodity Total:	Count:	2	119,760.00 LB		
							Account Total:	Count:	2	119,760.00 LB		
							Grand Total:	Count:	20	902,100.00 LB		

403,860
287,380

TPH Calc:

Total throughput = 403,860 lb + 287,380 lb + 119,760 lb / 2,000 lb/ton = 405.5 tons / 6.85 hrs =

59.2 TPH

APPENDIX C

Quality Assurance/Quality Control

Indices
1 - CEMS Stratification Checks
2 - Cylinder Gas and Equipment Certification Sheets
3 - AETB Documentation

Index C1 – CEMS Stratification Checks

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,	**Date:** 04/26/17			
Source:	Engine 1 / Outlet	**Start Time:** 9:35			
Run No.:	Stratification Check	**Stop Time:** 9:50			
Date/time	**O_2 (%vd)**				
4/25/2017 9:35:09 AM	11.00	move to pt 1	(first minute not used in average/response time purge)		
4/25/2017 9:36:09 AM	**11.60**				
4/25/2017 9:37:09 AM	**10.50**				
4/25/2017 9:38:09 AM	**10.80**				
4/25/2017 9:39:09 AM	**9.30**				
	10.55				
4/25/2017 9:40:09 AM	11.50	move to pt 2	(first minute not used in average/response time purge)		
4/25/2017 9:41:09 AM	**11.50**				
4/25/2017 9:42:09 AM	**11.40**				
4/25/2017 9:43:09 AM	**10.50**				
4/25/2017 9:44:09 AM	**9.80**				
	10.80				
4/25/2017 9:45:09 AM	11.70	move to pt 3	(first minute not used in average/response time purge)		
4/25/2017 9:46:09 AM	**9.80**				
4/25/2017 9:47:09 AM	**10.20**				
4/25/2017 9:48:09 AM	**10.70**				
4/25/2017 9:49:09 AM	**10.10**				
	10.20				
	-- Stratification Check Summary --				
	10.55	Pt 1 avg.			
	10.80	Pt 2 avg.			
	10.20	Pt 3 avg.			
Averages:	10.52				
5% Lower bound	9.99				
5% Upper bound	11.04				
Status:	**Pass**				

Note: Strat check not possible at inlet due to probe location that could not be accessed while unit was in operation

Instrumental Analyzer Monitoring Data (not corrected for calibrations)

Facility/Site:	wTe Recycling Greenfield,	**Date:** 04/26/17			
Source:	Engine 1 / Outlet	**Start Time:** 9:35			
Run No.:	Stratification Check	**Stop Time:** 9:50			
Date/time	**O_2 (%vd)**				
4/25/2017 9:35:09 AM	11.00	move to pt 1	(first minute not used in average/response time purge)		
4/25/2017 9:36:09 AM	**11.60**				
4/25/2017 9:37:09 AM	**10.50**				
4/25/2017 9:38:09 AM	**10.80**				
4/25/2017 9:39:09 AM	**9.30**				
	10.55				
4/25/2017 9:40:09 AM	11.50	move to pt 2	(first minute not used in average/response time purge)		
4/25/2017 9:41:09 AM	**11.50**				
4/25/2017 9:42:09 AM	**11.40**				
4/25/2017 9:43:09 AM	**10.50**				
4/25/2017 9:44:09 AM	**9.80**				
	10.80				
4/25/2017 9:45:09 AM	11.70	move to pt 3	(first minute not used in average/response time purge)		
4/25/2017 9:46:09 AM	**9.80**				
4/25/2017 9:47:09 AM	**10.20**				
4/25/2017 9:48:09 AM	**10.70**				
4/25/2017 9:49:09 AM	**10.10**				
	10.20				
	-- Stratification Check Summary --				
	10.55	Pt 1 avg.			
	10.80	Pt 2 avg.			
	10.20	Pt 3 avg.			
Averages:	10.52				
5% Lower bound	9.99				
5% Upper bound	11.04				
Status:	**Pass**				

Note: Strat check not possible at inlet due to probe location that could not be accessed while unit was in operation

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTR Recycling Greenfield, MA
Source: Eng 1 outlet

Operator: DCare
Date: 4/25/17

Run Number: Eng 1 - R1 - out
Start Time: 1032
End Time: 1132

START
move to pt 1 @ 935
940
945

R1 O_2 - 9.81
CO - 33.25

System Bias (SB)/Drift (D) Assessments – Reference Method

START / R1 (I)

START / R1 (F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O_2	0.00	0.15	11.02	11.10	0.00	0.10	11.02	11.15
CO	0.0	0.2	45.3	46.0	0.00	0.0	45.3	45.3

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100ppm		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: $SB = [(C_s - C_{Da})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

Facility/Site:	wTe Recycling Greenfield,	Date: 04/26/17
Source:	Engine 2	Start Time: 7:50
Run No.:	Stratification Check	Stop Time: 8:50

Date/time	O_2 (%vd)
4/26/2017 7:50:38 AM	10.00
4/26/2017 7:51:38 AM	10.80
4/26/2017 7:52:38 AM	10.20
4/26/2017 7:53:38 AM	9.70
4/26/2017 7:54:38 AM	9.90
4/26/2017 7:55:38 AM	10.00
4/26/2017 7:56:38 AM	9.60
4/26/2017 7:57:38 AM	9.90
4/26/2017 7:58:38 AM	9.70
4/26/2017 7:59:38 AM	12.00
4/26/2017 8:00:38 AM	9.70
4/26/2017 8:01:38 AM	10.30
4/26/2017 8:02:38 AM	10.40
4/26/2017 8:03:38 AM	9.80
4/26/2017 8:04:38 AM	10.10
4/26/2017 8:05:38 AM	10.00
4/26/2017 8:06:38 AM	9.90
4/26/2017 8:07:38 AM	10.00
4/26/2017 8:08:38 AM	10.40
4/26/2017 8:09:38 AM	9.50
Pt 1 averages:	**10.10**
4/26/2017 8:10:38 AM	10.00
4/26/2017 8:11:38 AM	10.00
4/26/2017 8:12:38 AM	9.90
4/26/2017 8:13:38 AM	9.80
4/26/2017 8:14:38 AM	9.40
4/26/2017 8:15:38 AM	9.90
4/26/2017 8:16:38 AM	9.90
4/26/2017 8:17:38 AM	9.80
4/26/2017 8:18:38 AM	9.90
4/26/2017 8:19:38 AM	10.00
4/26/2017 8:20:38 AM	10.10
4/26/2017 8:21:38 AM	9.90
4/26/2017 8:22:38 AM	10.00
4/26/2017 8:23:38 AM	10.10
4/26/2017 8:24:38 AM	9.80
4/26/2017 8:25:38 AM	9.90

Facility/Site:	wTe Recycling Greenfield,	Date: 04/26/17			
Source:	Engine 2	Start Time: 7:50			
Run No.:	Stratification Check	Stop Time: 8:50			
Date/time	O_2 (%vd)				
4/26/2017 8:26:38 AM	9.30				
4/26/2017 8:27:38 AM	9.70				
4/26/2017 8:28:38 AM	9.80				
4/26/2017 8:29:38 AM	9.80				
Pt 2 averages:	**9.85**				
4/26/2017 8:30:38 AM	10.00				
4/26/2017 8:31:38 AM	9.80				
4/26/2017 8:32:38 AM	9.90				
4/26/2017 8:33:38 AM	9.60				
4/26/2017 8:34:38 AM	10.00				
4/26/2017 8:35:38 AM	10.20				
4/26/2017 8:36:38 AM	10.20				
4/26/2017 8:37:38 AM	11.00				
4/26/2017 8:38:38 AM	9.80				
4/26/2017 8:39:38 AM	10.00				
4/26/2017 8:40:38 AM	9.70				
4/26/2017 8:41:38 AM	9.90				
4/26/2017 8:42:38 AM	10.30				
4/26/2017 8:43:38 AM	10.80				
4/26/2017 8:44:38 AM	10.10				
4/26/2017 8:45:38 AM	10.10				
4/26/2017 8:46:38 AM	9.90				
4/26/2017 8:47:38 AM	10.50				
4/26/2017 8:48:38 AM	9.70				
4/26/2017 8:49:38 AM	9.90				
Pt 3 averages:	**10.07**				

Facility/Site:	wTe Recycling Greenfield,		Date: 04/26/17		
Source:	Engine 2		Start Time: 7:50		
Run No.:	Stratification Check		Stop Time: 8:50		
Date/time	O_2 (%vd)				
	-- Stratification Check Summary --				
	10.10				Pt 1 avg.
	9.85				Pt 2 avg.
	10.07				Pt 3 avg.
Averages:	10.01				
Single Pt. Abs. standards:	±0.3%				
Status:	Pass				

Note: Strat check not possible at inlet due to probe location that could not be accessed while unit was in operation

MONTROSE
AIR QUALITY SERVICES

Client/Site: WTE Recycling
Source: Engine 2 Outlet

Operator: JD Carr
Date: 4/26/17

Run Number: Eng 2 - Run 1
Start Time: 750
End Time: 850

Run 1 O2 - 10.01
CO - 38.20

START more to PT 1 @ 750
2 @ 810
3 @ 830

System Bias (SB)/Drift (D) Assessments – Reference Method

Run 1 / START (I) Run 1 / START (F)

Pollutant/Diluent	Start Zero		Start Span (C_{MA})		Final Zero		Final Span (C_{MA})	
	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)	Cylinder Value (C_V)	Analyzer Response (C_S)
O2	0.00	0.20	10.99	11.20	0.00	0.20	10.99	11.05
CO	0.00	0.1	45.3	44.8	0.00	-0.2	45.3	44.4

Range selected for analyzer operation:

O_2 (%)	CO_2 (%)	CO (ppm)	NOx (ppm)	SO_2 (ppm)
25		100		

Sampling System Bias (SB) Criteria: ≤ ± 5% of span for zero and upscale gas, where:

Where: $SB = [(C_t - C_{DV})/CS] * 100\%$

Zero and Calibration Drift (D) Criteria: ≤ ± 3% of span, where

$D = |SB_{final} - SB|$

Index C2 – Cylinder Gas and Equipment Certification Sheets

MAINE OXY
Your First Choice for Gases, Welding & Innovative Solutions Since 1928
PurityPlus

EPA Protocol
Gas Mixture

SpecAir Specialty Gases

Customer:	Maine Oxy/ Spec-Air	Reference#:	013117SY-G
CGA:	590	Certification Date:	02/14/2017
Customer PO#:	248309	Expiration Date:	02/14/2025
Cylinder #:	EB0084752	Pressure, psig:	2000

Method: This standard was analyzed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, Procedure G1 (May 2012).

Analyzed Cylinder-

Components	Certified Concentration	Expanded Uncertainty	Assay Dates
Oxygen	10.99%	0.6%	2/14/17
Carbon Dioxide	9.51%	0.5%	2/14/17
Nitrogen	Balance	-	-

Reference Standard-

Type/SRM Sample	Cylinder #	Concentration
Oxygen/ GMIS	EB0040572	9.96%
Carbon Dioxide/ GMIS	EB0046334	10.97%
Oxygen/ SRM	CAL015787	20.72%
Carbon Dioxide/ SRM	CAL016053	15.63%

Instrument-

Instrument/ Model	Serial Number	Last Date Calibrated	Analytical Method
Micro GC/ MTI M200	170612	2/14/2017	Thermal Conductivity

These mixtures were prepared gravimetrically using a high load high sensitivity electronic scale. Prior to filling the scale is verified for accuracy throughout the target mass range against applicable NIST traceable weights. We certify that the weights are calibrated to ASTM E617-97 Echelon 1 tolerances.

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, Global Calibration Gases LLC shall have no liability in excess of the established charge for this service. Assayed at Global Calibration Gases LLC, Sarasota, Florida. No correction required for interfering gases.

The calibration results published in this certificate were obtained using equipment and standards capable of producing results that are traceable to National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI). The expanded uncertainties, if included on this certificate, use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. If uncertainties are not included on this certificate, they are available upon request. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from the calibration facility. Calibration certificates without signatures are not valid. This calibration meets the requirements of ISO/IEC 17025:2005. Do not use this standard when cylinder pressure is below 150 psig.

GLOBAL CALIBRATION GASES LLC

Produced by:
Global Calibration Gases LLC.
1090 Commerce Blvd N
Sarasota, Florida 34243
PGVP Vendor ID.: N22017

Principal Analyst: _____ **Date:** 02/14/2017

Principal Reviewer: _____ **Date:** 02/14/2017

MAINE OXY
Your First Choice for Gases, Welding & Innovative Solutions Since 1929
PurityPlus

EPA Protocol
Gas Mixture

SpecAir Specialty Gases

Customer:	Maine Oxy/ Spec-Air	Reference#:	120916DH-21
CGA:	590	Certification Date:	12/15/2016
Customer PO#:	243788	Expiration Date:	12/15/2024
Cylinder #:	EB0067341	Pressure, psig:	2000

Method: This standard was analyzed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, Procedure G1 (May 2012).

Analyzed Cylinder-

Components	Certified Concentration	Expanded Uncertainty	Assay Dates
Oxygen	11.02%	0.6%	12/15/16
Carbon Dioxide	9.47%	0.5%	12/15/16
Nitrogen	Balance	-	-

Reference Standard-

Type/SRM Sample	Cylinder #	Concentration
Oxygen/ GMIS	EB0040572	9.96%
Carbon Dioxide/ GMIS	EB0046334	10.97%
Oxygen/ SRM	CAL015787	20.72%
Carbon Dioxide/ SRM	CAL016053	15.63%

Instrument-

Instrument/ Model	Serial Number	Last Date Calibrated	Analytical Method
Micro GC/ MTI M200	170612	12/15/2016	Thermal Conductivity

These mixtures were prepared gravimetrically using a high load high sensitivity electronic scale. Prior to filling the scale is verified for accuracy throughout the target mass range against applicable NIST traceable weights. We certify that the weights are calibrated to ASTM E617-97 Echelon 1 tolerances.

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, Global Calibration Gases LLC shall have no liability in excess of the established charge for this service. Assayed at Global Calibration Gases LLC, Sarasota, Florida. No correction required for interfering gases.

The calibration results published in this certificate were obtained using equipment and standards capable of producing results that are traceable to National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI). The expanded uncertainties, if included on this certificate, use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. If uncertainties are not included on this certificate, they are available upon request. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from the calibration facility. Calibration certificates without signatures are not valid. This calibration meets the requirements of ISO/IEC 17025:2005. Do not use this standard when cylinder pressure is below 150 psig.

GLOBAL CALIBRATION GASES LLC

Produced by:
Global Calibration Gases LLC.
1090 Commerce Blvd N
Sarasota, Florida 34243
PGVP Vendor ID.: N22016

Analyst: _____
12/15/2016

Principal Reviewer: _____
Date: 12/15/2016

MAINE OXY
SPEC-AIR SPECIALTY GASES
PurityPlus

Maine Oxy
Spec-Air Specialty Gases
Auburn, ME

EPA Protocol
Gas Mixture

Customer:	Maine Oxy/ Spec-Air	Reference#:	123015SY-K
CGA:	590	Certification Date:	01/05/2016
Customer PO#:	214198	Expiration Date:	01/05/2024
Cylinder #:	EB0068441	Pressure, psig:	2000

Method: This standard was analyzed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, Procedure G1 (May 2012).

Analyzed Cylinder-

Components	Certified Concentration	Expanded Uncertainty	Assay Dates
Carbon Dioxide	18.99%	0.6%	1/5/16
Oxygen	20.98%	0.4%	1/5/16
Nitrogen	Balance	-	-

Reference Standard-

Type/SRM Sample	Cylinder #	Concentration
Carbon Dioxide/ GMIS	CC33430	15.07%
Oxygen/ GMIS	EB0054583	20.90%
Carbon Dioxide/ SRM	CAL016053	15.63%
Oxygen/ SRM	CAL015787	20.72%

Instrument-

Instrument/ Model	Serial Number	Last Date Calibrated	Analytical Method
Micro GC/ MTI M200	170612	1/5/2016	Thermal Conductivity

These mixtures were prepared gravimetrically using a high load high sensitivity electronic scale. Prior to filling the scale is verified for accuracy throughout the target mass range against applicable NIST traceable weights. We certify that the weights are calibrated to ASTM E617-97 Echelon 1 tolerances.

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, Global Calibration Gases LLC shall have no liability in excess of the established charge for this service. Assayed at Global Calibration Gases LLC, Sarasota, Florida. * Analytical methodology does not require correction for analytical interference

The calibration results published in this certificate were obtained using equipment and standards capable of producing results that are traceable to National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI). The expanded uncertainties, if included on this certificate, use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. If uncertainties are not included on this certificate, they are available upon request. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from the calibration facility. Calibration certificates without signatures are not valid. This calibration meets the requirements of ISO/IEC 17025-2005.

*Do not use this standard when cylinder pressure is below 150 psig.

GLOBAL CALIBRATION GASES LLC

Produced by:
Global Calibration Gases LLC.
1090 Commerce Blvd N
Sarasota, Florida 34243
PGVP Vendor ID.: N22016

Principal Analyst: _____
Date: 01/05/2016

Principal Reviewer: _____
Date: 01/05/2016

MAINE OXY
SPEC-AIR SPECIALTY GASES
PurityPlus

Maine Oxy
Spec-Air Specialty Gases
Auburn, ME

EPA Protocol Gas Mixture

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Customer:	Maine Oxy/ Spec-Air	Reference#:	073115SY-T
CGA:	660	Certification Date:	08/12/2015
Customer PO#:	201632	Expiration Date:	08/12/2023
Cylinder #:	EB0066552	Pressure, psig:	2000

Method: This standard was analyzed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, Procedure G1 (May 2012).

Analyzed Cylinder-

Components	Certified Concentration	Expanded Uncertainty	Assay Dates
Nitric Oxide	457ppm	0.8%	8/5/15, 8/12/15
Oxides of Nitrogen	459ppm	0.8%	8/5/15, 8/12/15
Sulfur Dioxide	450ppm	1.0%	8/4/15, 8/11/15
Carbon Monoxide	448ppm	0.7%	8/4/15
Nitrogen	Balance	-	-

Reference Standard-

Type/SRM Sample	Cylinder #	Concentration
Nitric Oxide/ GMIS	EB0040927	486ppm
Oxides of Nitrogen/ GMIS	EB0040927	490ppm
Sulfur Dioxide/ GMIS	CC33830	526ppm
Carbon Monoxide/ GMIS	EB0040726	513ppm
Nitric Oxide/ SRM	CAL017400	244.5ppm
Oxides of Nitrogen/ SRM	CAL017400	244.7ppm
Sulfur Dioxide/ SRM	FF28126	490.9ppm
Carbon Monoxide/ SRM	FF30742	247.1ppm

Instrument-

Instrument/ Model	Serial Number	Last Date Calibrated	Analytical Method
CAI/ 600	Y09003	8/12/2015	Chemiluminescence
Horiba/ VIA-510	MAID39C8	8/11/2015	Non-Dispersive Infrared
Micro GC/ MTI M200	170612	8/4/2015	Thermal Conductivity

These mixtures were prepared gravimetrically using a high load high sensitivity electronic scale. Prior to filling the scale is verified for accuracy throughout the target mass range against applicable NIST traceable weights. We certify that the weights are calibrated to ASTM E617-97 Echelon 1 tolerances.

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, Global Calibration Gases LLC shall have no liability in excess of the established charge for this service. Assayed at Global Calibration Gases LLC, Sarasota, Florida. * Analytical methodology does not require correction for analytical interference

The calibration results published in this certificate were obtained using equipment and standards capable of producing results that are traceable to National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI). The expanded uncertainties, if included on this certificate, use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. If uncertainties are not included on this certificate, they are available upon request. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from the calibration facility. Calibration certificates without signatures are not valid. This calibration meets the requirements of ISO/IEC 17025-2005.

*Do not use this standard when cylinder pressure is below 150 psig.

GLOBAL CALIBRATION GASES LLC

Produced by:
Global Calibration Gases LLC.
1090 Commerce Blvd N
Sarasota, Florida 34243
PGVP Vendor ID.: N22015

Principal Analyst: Ruth Wilson
Date: 08/12/2015

Principal Reviewer: Jennifer Toney
Date: 08/12/2015

MAINE OXY
SPEC-AIR SPECIALTY GASES
PurityPlus

Maine Oxy
Spec-Air Specialty Gases
Auburn, ME

EPA Protocol Gas Mixture

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8/28

Customer:	Maine Oxy/ Spec-Air	Reference#:	073115SY-U
CGA:	660	Certification Date:	08/12/2015
Customer PO#:	201632	Expiration Date:	08/12/2023
Cylinder #:	EB0066972	Pressure, psig:	2000

Method: This standard was analyzed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, Procedure G1 (May 2012)

Analyzed Cylinder-

Components	Certified Concentration	Expanded Uncertainty	Assay Dates
Nitric Oxide	953ppm	0.5%	8/5/15, 8/12/15
Oxides of Nitrogen	955ppm	0.5%	8/5/15, 8/12/15
Sulfur Dioxide	942ppm	0.7%	8/5/15, 8/12/15
Carbon Monoxide	945ppm	0.7%	8/5/15
Nitrogen	Balance	-	-

Reference Standard-

Type/SRM Sample	Cylinder #	Concentration
Nitric Oxide/ GMIS	GN0000358	952ppm
Oxides of Nitrogen/ GMIS	GN0000358	957ppm
Sulfur Dioxide/ GMIS	GN0000349	887ppm
Carbon Monoxide/ GMIS	EB0054924	993ppm
Nitric Oxide/ SRM	FF10441	985.3ppm
Oxides of Nitrogen/ SRM	FF10441	985.3ppm
Sulfur Dioxide/ SRM	CAL015155	1480.2ppm
Carbon Monoxide/ SRM	CAL017168	2438ppm

Instrument-

Instrument/ Model	Serial Number	Last Date Calibrated	Analytical Method
CAI/ 600	Y09003	8/12/2015	Chemiluminescence
Horiba/ VIA-510	MAID39C8	8/12/2015	Non-Dispersive Infrared
Micro GC/ MTI M200	170612	8/5/2015	Thermal Conductivity

These mixtures were prepared gravimetrically using a high load high sensitivity electronic scale. Prior to filling the scale is verified for accuracy throughout the target mass range against applicable NIST traceable weights. We certify that the weights are calibrated to ASTM E617-97 Echelon 1 tolerances.

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, Global Calibration Gases LLC shall have no liability in excess of the established charge for this service. Assayed at Global Calibration Gases LLC, Sarasota, Florida * Analytical methodology does not require correction for analytical interference

The calibration results published in this certificate were obtained using equipment and standards capable of producing results that are traceable to National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI). The expanded uncertainties, if included on this certificate, use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. If uncertainties are not included on this certificate, they are available upon request. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from the calibration facility. Calibration certificates without signatures are not valid. This calibration meets the requirements of ISO/IEC 17025-2005.

*Do not use this standard when cylinder pressure is below 150 psig

GLOBAL CALIBRATION GASES LLC

Produced by:
Global Calibration Gases LLC.
1090 Commerce Blvd N
Sarasota, Florida 34243
PGVP Vendor ID.: N22015

Principal Analyst: Keith Walker
Date: 08/12/2015

Principal Reviewer: Jeanne Honey
Date: 08/12/2015

Index C3 – AETB Documentation

STAC STACK TESTING ACCREDITATION COUNCIL

A2LA American Association for Laboratory Accreditation

Accredited Air Emission Testing Body

A2LA has accredited

MONTROSE AIR QUALITY SERVICES

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this organization is accredited to perform testing activities in compliance with ASTM D7036 - Standard Practice for Competence of Air Emission Testing Bodies.

Presented this 2nd day of February 2016

Senior Director of Quality and Communications
Certificate Number 3925.01
Valid to February 28, 2018

This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.

MONTROSE
ENVIRONMENTAL

Qualified Individual Conformance Statement

I David Curran, as a QI (Qualified Individual) sign this Conformance Statement to verify that each of the test projects that I perform, and each of the test projects performed under my supervision will conform with the Montrose Air Quality Services Management System, the test methods applicable to the testing, and ASTM D 7036-04.

I realize that as a Qualified Individual I have the proper knowledge to perform these tests correctly, and that I am held to a high standard of integrity.

QI Signature

3/25/16
Date

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

DAVID A. CARON

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 29TH DAY OF AUGUST 2013 AND EFFECTIVE UNTIL AUGUST 28TH, 2018

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pekalnis, QSTI/QSTO Review Board

Theresa Lowe, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION NO. 2008-214

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

DAVID A. CARON

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 29TH DAY OF OCTOBER 2013 AND EFFECTIVE UNTIL OCTOBER 28TH, 2018

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

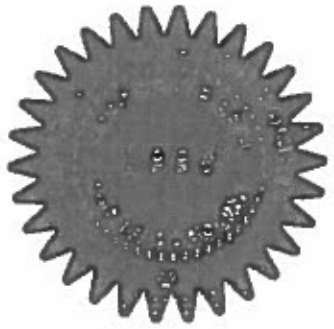
Theresa Lowe, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION NO. 2008-214



SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

DAVID A. CARON

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 27TH DAY OF MAY 2016 AND EFFECTIVE UNTIL MAY 26TH, 2021

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

Theresa Lowe, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Bruce Randall QSTI/QSTO Review Board

CERTIFICATE NO. 2008-214

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

DAVID A. CARON

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

HAZARDOUS METALS MEASUREMENT SAMPLING METHODS

ISSUED THIS 22ND DAY OF JANUARY 2015 AND EFFECTIVE UNTIL JANUARY 21ST, 2020

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

Theresa Lowe, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

CERTIFICATE ID NO. 2008-214

MONTROSE
AIR QUALITY SERVICES

Probe Thermocouple Calibration

TC ID: S-6-1 Cal Date: 4/28/2017 Technician: Mike Bruni

Reference Type: Digital Thermometer Exp Date: 4/28/2018 (signature on file)

Reference S/N : 151927836

Ambient (~70 °F)

	Ref Temp °F (T_R)	T/C Temp °F (T_T)	% Error
Run 1	73	73	0.00%
Run 2	73	73	0.00%
Run 3	73	73	0.00%
Pass/Fail			PASS

Boiling Water (~212 °F)

	Ref Temp °F (T_R)	T/C Temp °F (T_T)	% Error
Run 1	212	213	-0.15%
Run 2	212	213	-0.15%
Run 3	212	213	-0.15%
Pass/Fail			PASS

Hot Oil (~300-500 °F)

	Ref Temp °F (T_R)	T/C Temp °F (T_T)	% Error
Run 1	358	359	-0.12%
Run 2	358	360	-0.24%
Run 3	358	360	-0.24%
Pass/Fail			PASS

Test Pass/Fail PASS

Calibration tolerance for each run is 1.5%.

% Error = $(((T_R + 460) - (T_T + 460)) / (T_R + 460)) \cdot 100$

Calibration conducted in accordance with EPA Method 2, Section 10.3.

Eastmount Environmental Services, LLC / DBA MAQS Newburyport
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www.montrose-env.com